Government of Bombay
Public Works Department

# Irrigation Administration Report

## Province of Bombay

**Part I**

*For the Year 1938-39*





BOMBAY
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1940

# MAP OF THE PROVINCE OF BOMBAY

TO ACCOMPANY THE IRRIGATION ADMINISTRATION REPORT FOR 1938-39

SCALE 40 MILES TO 1 INCH




## NORTHERN CIRCLE

### AHMEDABAD DIVISION:

AHMEDABAD DISTRICT.

*Works in Operation.*

1. Hathmati Canal
2. Bokh Reservoir
3. Timba Tank
4. Odhav-Solgam Drain
5. Panar-Dediasan Drainage
6. Viramgam Drainage
7. Narsingpur Drainage
8. Hebatpur Drain
9. Khari Cut
10. Chekhla Drain
11. Ghoda Feeder
12. Ogan Drain
13. Godhavi Goraj Drain
14. Chandola Tank
15. Vasai Reservoir
16. Bhayla Feeder
17. Eastern & Western Drainage at Dholka

KAIRA DISTRICT.

*Works in Operation.*

18. Khari Sluices
19. Gobhlaj Tank
20. Galki Tank
21. Bherai Reservoir
22. Naika Reservoir

### KAIRA & PANCH MAHALS DIVISION.

PANCH MAHALS DISTRICT.

*Works in Operation.*

1. Pania Tank
2. Warod Sapoi Tank
3. Mandelao Tank
*4. Suki River Project
5. Muwalia Tank
6. Futelao Tank
7. Garbada Tank
8. Chharchhora Ambli Tank
*9. Rajayata Wandeli Tank
10. Dangaria Tank
*11. Orwada Tank
12. Boridra Tank
*13. Guneli Tank
14. Ratneshwar Tank
*15. Kanelao Tank
16 Malao Tank
*17. Wada Talao Tank

KAIRA DISTRICT.

*Works in Operation.*

18. Wangroli Tank
19. Matewal Tank
20. Savli Tank
21. Phudsar Tank
22. Saiat Tank
23. Matar Drain
24. Tranja Tank
25. Nagrama Tank
*26. Pariej Tank
27. Tarapur Gorad Drain
28. Karamsad Drain
29. Anand Mogri Drain

*Note:—*

Incomplete works marked thus ------*

### SURAT & BROACH DIVISION.

(I) BROACH DISTRICT.

*Works in Operation.*

1. Channel from Uber Vile to meet Channel near Daba
2. Nobar-umra-Kotasar Drainage Channel
3. Namdhana-Nabar Drainage Channel
4. Bund at Dehej
5. Sindhav Drainage Channel
6. Kora-Madapher-Jantran Drainage Channel
7. Amanpur-Nadiad Drainage Channel
8. Bund Between Nada and Devla Villages
9. Bund at Nada Village
10. do at Islampur
11. Ghamnad Drainage Chal. including Danda and Shimaltha
12. Wansetta Drainage Channel
13. Asarsa Reclamation Bund
14. Ninum Channel
15. Protective Bund at Gandhar
16. Ora-Vichiad-Badalpur Channel
17. Rahad Channel
18. Kolvan Itola Drainage Chal.
19. Bund at Aladar
20. Pakhajan-Ambhel Channel
21. Waghusan Drainage Channel
22. Wansi Channel
23. Protective Bund at Harinagar
24. do do at Kadodra
25. Samadhpur Paniadra Chal.
26. Nadida-Akhod Channel
27. Bund at Suva
28. Jolva Channel
29. Protective Bund at Lakhigam
30. Asta Channel
31. Hansot Reclamation Bund
32. Adol Hajat Channel.

(II) SURAT DISTRICT.

*Works in Operation.*

33. Morthan Channel
34. Bund between Kapasi and Kundiana Villages.
35. Waghrej Protective Works.

## CENTRAL CIRCLE

### SATARA DIVISION.

SATARA DISTRICT.

*Works in Operation*

1. Krishna Canal
2. Rewari Canal
3. Mayani Tank.
4. Upper Man River Works Pingli Tank.
5. Yerla River Works Nehr Tank.
6. Chikhli Canal.

*Incomplete Work*

7. Goregaon Tank.

### SHOLAPUR DIVISION.

SHOLAPUR DISTRICT.

*Works in Operation.*

1. Ekruk Tank
2. Ashti do
3. Pathri Tank
4. Wadshivne Tank
5. Koregaon Tank
6. Mhaswad Tank and Nira Right Bank Canal Branch No. III from mile No 101 to 105¼.

*Incomplete Works.*

7. Budhihal Tank
8. Hotgi Tank
9. Mangi Tank

### NASIK DIVISION

*Works in Operation.*

1. Khirdi Sathe Tank
2. Parsul Tank

### KHANDESH DIVISION.

WEST KHANDESH DISTRICT,

*Works in Operation.*

1. Mukti Tank
2. Talwada do
3. Tapti River Minor Tributaries
4. Upper Panjhra River Group
5. Lower Panjhra River Group
6. Burai River Group
7. Kan River Group

*Incomplete Work.*

8. Parmapada Tank

EAST KHANDESH DISTRICT.

*Works in Operation.*

9. Jamda R. B. Canal
10. do L. B. do
11. Mhaswa Tank
12. Hartala do

## DECCAN IRRIGATION CIRCLE

### NASIK IRRIGATION DIVISION.

NASIK DISTRICT.

*Works in Operation.*

1. (D.I.C.) Waghad Tank.
2. (D.I.C.) Chankapur Tank
3. Girna Canal
4. Palkhed do
5. Wadali do
6. Ojhar Tambat Canal
7. Girna Group
8. Aram Group
9. Mosam do
10. Godavari do
11. Kadwa Group
12. Darna do
13. Deo do
14. Mahalungi Group
15. Darna Reservoir (Lake Beale)
16. Godavari R. B. Canal (from mile 0 to mile 35)
17. Godavari L. B. Canal (from mile 0 to mile 20½)

*Work under Construction—Incomplete Work.*

18. Odal Tank

AHMEDNAGAR DISTRICT.

*Works in Operation.*

19. Godavari R. B. Canal (from mile 35 to mile 69)
20. Godavari L. B. Canal (from mile 21½ to mile 48)

### AHMEDNAGAR DIVISION.

AHMEDNAGAR DISTRICT.

*Works in Operation.*

1. Wilson Dam (Lake A. Hill.)
2. Pravara R. B. Canal
3. do L. B. Canal
4. Lakh Canal.
5. Bhatodi Tank
6. Khuntephal Tank
7. Pimpalgaon Tank
8. Visapur Tank

### POONA IRRIGATION & RESEARCH DIVISION

POONA DISTRICT

*Works in Operation.*

1. Lake Fife
2. Mutha R. B. Canal
3. Mutha L. B. do
4. Matoba Tank
5. Kasurdi Tank
6. Shirsuphal Tank
7. Bhadalwadi Tank

*Incomplete Works.*

8. Khamgaon Tank.
9. Warvand Tank.

### NIRA CANALS DIVISION.

POONA DISTRICT.

*Works in Operation*

1. Lloyd Dam at Bhatgar (New Lake Whiting)
2. Nira R. B. Canal (from mile 0 to mile 11½).
3. Nira L. B. Canal.
4. Shetphal Tank.

SATARA DISTRICT.

5. Nira R. B. Canal (from mile 11½ to mile 47)

SHOLAPUR DISTRICT.

6. Nira R. B. Canal (from mile 47 to mile 100)

*Incomplete Work.*

7. Bhamburdi Tank.

## SOUTHERN CIRCLE

### BELGAUM DIVISION

BELGAUM DISTRICT.

*Works in Operation.*

1. Gokak Canal:—1st Section and Storage Works
2. Gadikeri Tank

### DHARWAR DIVISION.

DHARWAR DISTRICT.

*Works in Operation.*

1. Dambal Tank
2. Medleri do
3. Madag do
4. Asundi Tank
5. Dharma and Naregal Canals

BIJAPUR DISTRICT

6. Muchkundi Tank

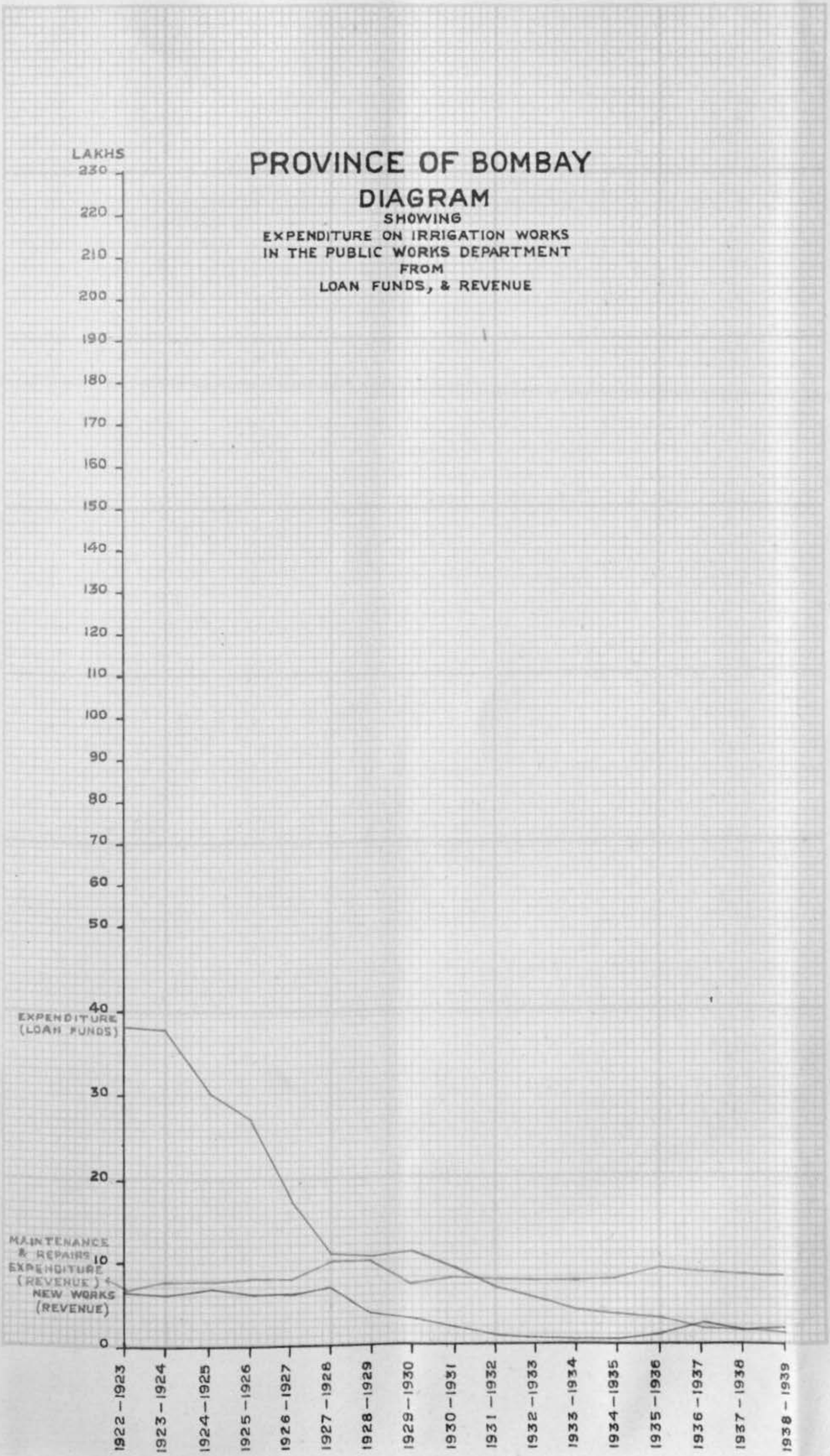
### KANARA DIVISION

KANARA DISTRICT

*Work in Operation.*

1. Mavinkop Tank.

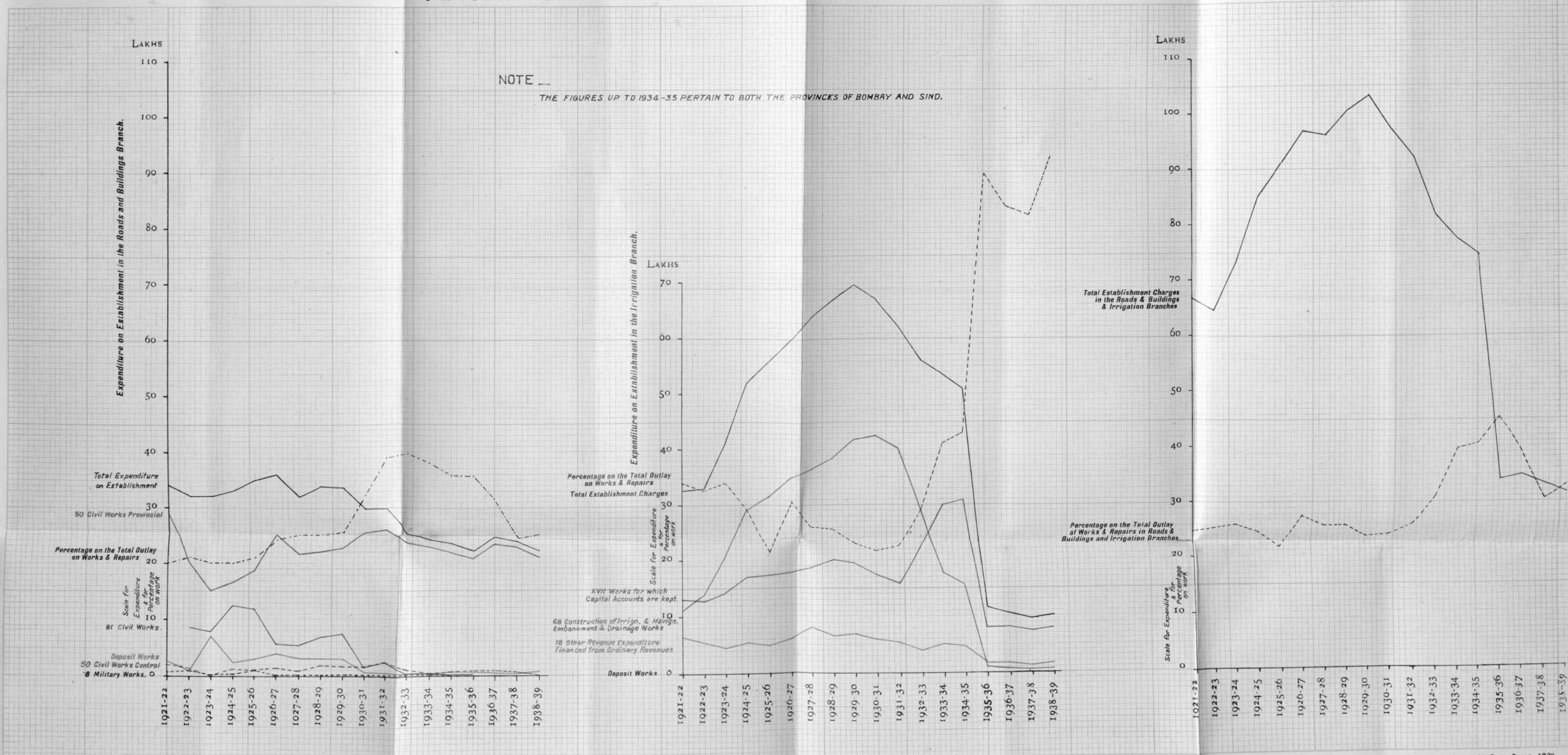
G. P. Z. O. POONA, 1939.




G.P.Z.O. POONA, 1939.

# PROVINCE OF BOMBAY

## DIAGRAM SHOWING EXPENDITURE ON ESTABLISHMENT IN THE ROADS & BUILDINGS & IRRIGATION BRANCHES OF THE PUBLIC WORKS DEPARTMENT AND PERCENTAGES TO THE TOTAL OUTLAY ON WORKS AND REPAIRS




Govt. Photozincographic Dept. Poona. 1939.

# IRRIGATION ADMINISTRATION REPORT, PROVINCE OF BOMBAY, PART I 1938–39.

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## PHYSICAL FEATURES—GENERAL DESCRIPTION OF IRRIGATION.

The area under irrigation in the Province of Bombay is not compact. Rainfall is available for agricultural operations but is often precarious. Tanks and canals provide irrigation for valuable crops such as sugarcane and also provide a source of supply to other crops when the rainfall is deficient or irregular. The old irrigation works consist chiefly of a few small canals and moderately large tanks, some 12,000 smaller tanks mostly in the southern part of the Province and in Gujarat, and of about 400 bandharas in Nasik and Khandesh Districts. The tanks have earthen dams and the larger ones irrigate areas up to 1,300 acres, and the smaller ones up to 500 acres, situated immediately below the dams. The chief crop irrigated is rice. The bandharas are masonry weirs built across rivers to head up the water to a level sufficient to irrigate lands on the banks of the streams by means of channels taking off from the flanks of the bandharas. The areas irrigated are up to 800 acres and the chief crops are sugarcane, wheat, bajri and gram. From these small beginnings have evolved the magnificent irrigation works, which now form such a conspicuous feature in the Deccan and have so successfully fulfilled their beneficent purpose in banishing the famines which formerly devastated this portion of the Province.

2. The irrigation works in the Deccan are fundamentally different from those in Sind, the Punjab, Egypt or Mesopotamia, where wide alluvial plains have been formed by great deltaic rivers in perennial flow. The Bombay Deccan consists of a sloping table-land running eastward from the ridge of the Western Ghats. These form a ridge running parallel to the sea-coast at a distance from it of 50 to 100 miles; precipitous on the western side, they fall away more gradually to the east. The heaviest rainfall occurs on the peak of the ridge, where anything up to 270 inches of rain is recorded in the four monsoon months. The intensity of the rainfall rapidly decreases as we go eastward fromthe highest ridge, reaching a figure of 20 or 25 inches at a distance of 100 or 150 miles east of the Ghats. The rivers in the Deccan rise in the valleys close to the ridge, flow in an eastward direction, and aredry or practically so for 7 or 8 months of the year. The line of the Ghats, like the ridge of a roof, divides the rainfall into two parts; one the smaller portion falling westward into the Indian Ocean, and the other flowing through long lengths of tortuous rivers to the east and joining the rivers, which reach the sea on the south-eastern coast of the peninsula. These rivers are in flow during the

monsoon months only, and if no artificial means of conserving their waters were provided, the whole monsoon rainfall would be wasted so far as the Bombay Deccan is concerned, and would simply flow away to the sea, benefiting but to a small extent the country traversed.

3. The large irrigation systems in the Deccan are all of the same type. Each depends upon a storage lake near the head of one of the river valleys, where sufficient water is collected during the monsoon to supply the country on either side of the river valley below. The water stored during the rains is let out during the dry months of the year in accordance with requirements ; and at a point on the river, which may be as far as 50 miles from the main storage lake, a " pick-up-weir " is constructed across the river-course to divert the water into canals which take off on either side of the weir. In one case only, that of Lake Fife at Khadakwasla near Poona, do the canals take off from the flanks of the dam itself. The canals are always constructed at a considerably flatter slope than that of the river, and consequently are able to diverge from the river itself on each side of the valley ; as a rule each canal only irrigates the area between itself and the river.

# SECTION I

## COMPRISING IRRIGATION WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT.

### GENERAL REMARKS.

**Works in operation.** 4. The following list includes all the works in operation (43 in number) :—

| Serial number. | Name of Work. | Area of four months' crops which could be irrigated in normal years with a duty at the head of the canal of 120 acres for the monsoon and 120 acres for the rabi season per cusec. | Whether supply is reliable or dependent on local rain. | Whether storage works completed or proposed. | Remarks. |
|---|---|---|---|---|---|
| | | Acres. | | | |
| 1 | Hathmati and Khari Cut Canals. | 24,000 | Dependent on local rain. | No storage work. Bokh reservoir, Chandola tank and Wasai reservoir, completed. | The catchment of the Hathmati river is hilly, covered partly with forest and that of the Khari is undulating ground at its source and then plain ground with cultivated fields. The supply depends upon the flow in the rivers, and the contents of the Bokh reservoir, Chandola tank and Wasai reservoir. |
| 2 | Wangroli Tank .. | 3,400 | Do. .. | Completed .. | The catchment is ordinary plain ground and cultivated fields. |
| 3 | Savli Tank .. | 3,000 | Do. .. | Do. .. | Ordinary catchment on undulating ground. |
| 4 | Saiat Tank .. | 2,000 | Do. .. | Do. .. | Ordinary catchment on flat ground. |
| 5 | Tranza Nagrama Tanks | 800 | Do. .. | Do. .. | The Tranza tank has no independent catchment. The Nagrama has a catchment of 1·5 sq. miles. Both are fed by the Matar drainage channel which is not reliable as it seldom flows. |
| 6 | Futelao Tank .. | 800 | Do. .. | Do. .. | Hilly catchment. |
| 7 | Nira Left Bank Canal including Shetphal Tank. | 100,000 | Reliable .. | Lake Whiting (Lloyd Dam) completed. | Ghat catchment. |
| 8 | Nira Right Bank Canal | 180,000 | Do. .. | Do. .. | Do. |
| 9 | Mutha Canals including Matoba Tank. | 49,000 | Do. .. | Lake Fife: completed. | Do. |
| 10 | Kasurdi Tank .. | 40 | Dependent on local rain. | Completed .. | Deccan catchment. |

| Serial number. | Name of Work. | Area of four months' crops which could be irrigated in normal years with a duty at the head of the canal of 120 acres for the monsoon and 120 acres for the rabi season per cusec. | Whether supply is reliable or dependent on local rain. | Whether storage works completed or proposed. | Remarks. |
|---|---|---|---|---|---|
| | | Acres. | | | |
| 11 | Shirsuphal Tank .. | 1,150 | Dependent on local rain. | Completed .. | Deccan catchment. |
| 12 | Bhadalvadi Tank .. | 1,123 | Do. .. | Do. .. | Do. |
| 13 | Godavari Right Bank Canal. | 44,000 | Reliable .. | Lake Beale : completed. | Ghat catchment. |
| | Godavari Left Bank Canal. | 26,000 | | | |
| 14 | Girna Canal .. | 9,000 | Do. .. | Chankapur Tank completed. | Do. |
| 15 | Kadwa River Works. { Palkhed Canal. Ojhar Tambat Canal. Wadali Canal. } | 7,689 | Do. .. | Waghad Tank completed. | Do. |
| 16 | Pravara Right Bank Canal. | 18,480 | Do. .. | Lake Arthur Hill (Wilson Dam) completed. | Do. |
| | Pravara Left Bank Canal. | 64,080 | | | |
| 17 | Bhatodi Tank .. | 1,461 | Dependent on local rain. | Completed .. | Deccan catchment. |
| 18 | Ekruk Tank .. | 13,070 | Do. .. | Do. .. | Do. |
| 19 | Mhaswad Tank .. | 14,000 | Do. .. | Do. .. | Do. |
| 20 | Koregaon Tank .. | 416 | Do. .. | Do. .. | Hilly catchment. |
| 21 | Ashti Tank .. | 3,382 | Do. .. | Do. .. | Deccan catchment. |
| 22 | Pathri Tank .. | 3,094 | Do. .. | Do. .. | Hilly catchment. |
| 23 | Jamda Canals .. | 42,000 | Girna river supply not reliable. | Water is issued from the Chankapur Tank when available. | Ghat catchment for a small part and for the rest Deccan catchment. |
| 24 | Hartala Tank .. | 978 | Dependent on local rain. | Completed .. | Deccan catchment. |
| 25 | Mhaswa Tank .. | 3,256 | Do. .. | Do. .. | Do. |
| 26 | Shahada Channel .. | 2,000 | Reliable .. | No storage work .. | Hilly catchment. Supply is perennial. |
| 27 | Lower Panjhra River Works. | 8,173 | Panjhra river supply not reliable. | Mukhi Tank completed. | Ghat catchment for one part and Deccan catchment for the rest. |
| 28 | Krishna Canal .. | 6,412 | Reliable .. | Proposed .. | Ghat catchment. |
| 29 | Rewari Canal .. | 439 | Dependent on local rain. | No storage work .. | Deccan catchment. |

| Serial Number. | Name of Work. | Area of four months' crops which could be irrigated in normal years with a duty at the head of the canal of 120 acres for the monsoon and 120 acres for the rabi season per cusec. | Whether supply is reliable or dependent on local rain. | Whether storage works completed or proposed. | Remarks. |
|---|---|---|---|---|---|
| | | Acres. | | | |
| 30 | Upper Man River Works. | 373 | Dependent on local rain. | Pingli Tank completed. | Deccan catchment. |
| 31 | Yerla River Irrigation Works. | 1,182 | Do. .. | Nehr Tank completed. | Do. |
| 32 | Chikhli Canal .. | 358 | Do. .. | No storage work .. | Do. |
| 33 | Maini Tank .. | 455 | Do. .. | Completed .. | Do. |
| 34 | Parsul Tank .. | 1,440 | Do. .. | Do. .. | Do. |
| 35 | Gadikeri Tank .. | 416 | Do. .. | Do. .. | Do. |
| 36 | Gokak Canal .. | 17,627 | Reliable .. | (27′) completed .. | Ghat catchment. |
| 37 | Muchkundi Tank .. | 750 | Dependent on local rain. | Completed .. | Deccan catchment. |
| 38 | Dambal Tank .. | 531 | Do. .. | Do. .. | Do. |
| 39 | Medleri Tank .. | 231 | Do. .. | Do. .. | Do. |
| 40 | Madag Tank .. | 1,418 | Do. .. | Do. .. | Ghat and Forest catchment. |
| 41 | Asundi Tank .. | 503 | Do. .. | Do. .. | Deccan catchment. |
| 42 | Dharma Canal .. | For monsoon season 12,870 acres. For rabi nil. | Do. .. | No storage work. The canal takes off from the river itself. | Forest catchment. |
| 43 | Mavinkop Tank .. | 617 | Do. .. | Completed .. | Do. |

Ekruk tank, Gadikeri tank, Mavinkop tank and Shahada channel are the only productive works and the rest are unproductive.

5. The interest account for the year was as follows :—

| —— | Productive Works. | Unproductive Works. | Total. |
|---|---|---|---|
| | Rs. | Rs. | Rs. |
| Total interest charges during 1938-39 .. | 46,361 | 41,20,752 | 41,67,113 |
| Net revenue realised during 1938-39 .. | 1,18,917 | 14,07,810 | 15,26,727 |

Net loss, i.e., difference between interest and net revenue—Rs. 26,40,386.

6. The financial results of the year by main heads were as under :—

| — | Area irrigated. | Revenue realised: Direct receipts. | Share of land revenue. | Total. | Working expenses. | Net revenue. |
|---|---|---|---|---|---|---|
| | Acres. | Rs. | Rs. | Rs. | Rs. | Rs. |
| Productive .. .. | 7,077 | 1,34,013 | 10,087 | 1,44,100 | 25,183 | 1,18,917 |
| Unproductive .. .. | 263,573 | 30,47,731 | 15,091 | 30,62,822 | 16,55,012 | 14,07,810 |
| Total .. | 270,650* | 31,81,744 | 25,178 | 32,06,922 | 16,80,195 | 15,26,727 |

*Inclusive of 12,123 acres under consolidated assessment.

The gross revenue and the net revenue show decreases of Rs. 28,973 and Rs. 82,649, respectively, as compared with the figures for the previous year.

**Area irrigated, revenue, etc.**

7. The figures of the area irrigated, the revenue assessed and realised and the working expenses, as compared with those of the previous three years, are given below :—

| Year. | Area irrigated*. | Revenue: Assessment. | Revenue: Realisations. | Working expenses. |
|---|---|---|---|---|
| | Acres. | Rs. | Rs. | Rs. |
| 1935-36 .. .. .. | 214,303 | 28,03,346 | 28,30,067 | 17,23,000 |
| 1936-37 .. .. .. | 313,973 | 34,77,222 | 30,66,641 | 17,29,930 |
| 1937-38 .. .. .. | 320,006 | 33,83,235 | 32,35,895 | 16,26,519 |
| Average .. | 282,760 | 32,21,267 | 30,44,201 | 16,93,149 |
| 1938-39 .. .. .. | 270,650 | 31,17,788 | 32,06,922 | 16,80,195 |

* Inclusive of the area under consolidated water and land assessment.

8. The gross area under command is 1,799,000 acres. The area irrigable at present is 626,000 acres.

9. The state of Revenue collections was as follows :—

| | | |
|---|---|---|
| Balance of demands unrealised at the commencement of the year .. .. .. | | Rs. 18,54,647 |
| Demands of the year— | Rs. | |
| Rabi 1937-38 .. .. | 5,79,517 | |
| Kharif 1938-39 .. .. | 21,24,756 | |
| Miscellaneous receipts .. .. | 4,40,296 | |
| | | 31,44,569 |
| | Total .. | 49,99,216 |
| *Deduct*— | | |
| Remissions .. .. .. .. | | 31,128 |
| | Net total .. | 49,68,088 |
| Amount unrealised at the close of the year .. | | 17,78,494 |
| | Rs. | |
| Actual receipts of the year .. .. | 31,89,594 | |
| *Add*— | | |
| Share of land revenue .. .. | 25,178 | |
| | | 32,14,772 |
| *Deduct*— | | |
| Refunds of revenue .. .. .. | | 7,850 |
| Revenue realised .. .. .. | | 32,06,922 |

The remissions and refunds together amounted to Rs. 38,978.

Unrealised irrigation revenue at the close of the year amounted to Rs. 17,78,494 which is made up as follows :—

| | Rs. |
|---|---|
| Ekruk Tank .. .. .. .. | 12,010 |
| Hathmati and Khari Cut Canals .. .. | 11,083 |
| Krishna Canal .. .. .. .. | 62,413 |
| Ashti Tank .. .. .. .. | 6,870 |
| Lower Panjhra River Works .. .. | 7,396 |
| Mutha Canals and Matoba Tank .. | 1,76,409 |
| Gokak Canal .. .. .. .. | 25,372 |
| Mhaswad Tank .. .. .. .. | 44,995 |
| Jamda Canals .. .. .. .. | 8,220 |
| Pathri Tank .. .. .. .. | 5,113 |
| Nira Left Bank Canal and Shetpal Tank .. | 4,12,754 |
| Chankapur Tank—Girna Canal .. .. | 97,192 |
| Kadwa River Works .. .. .. | 86,141 |
| Godavari Canals .. .. .. | 98,625 |
| Nira Right Bank Canal .. .. .. | 3,61,658 |
| Pravara River Works .. .. .. | 3,29,012 |
| Other Works .. .. .. .. | 33,231 |
| Total .. | 17,78,494 |

**Working expenses.**

10. The working expenses of the year amounted to Rs. 16,80,195 as compared with Rs. 16,26,519 during the previous year. The following table compares the charges under the principal heads with those of the previous three years :—

| — | 1935–36 | 1936–37 | 1937–38 | 1938–39 |
|---|---|---|---|---|
| | Rs. | Rs. | Rs. | Rs. |
| Works .. .. .. | 67,604 | 1,85,616 | 1,44,956 | 1,37,680 |
| Repairs .. .. .. | 6,64,485 | 5,93,823 | 5,80,762 | 5,78,687 |
| Establishment .. .. .. | 9,11,468 | 8,68,902 | 8,14,161 | 8,69,198 |
| Tools and Plant.. .. .. | 10,078 | 8,805 | 7,914 | 10,327 |
| Total in the Public Works Department .. | 16,53,635 | 16,57,146 | 15,47,793 | 15,95,892 |
| Collection charges.. .. | 62,049 | 64,992 | 71,472 | 77,144 |
| Indirect charges .. .. | 7,316 | 7,792 | 7,254 | 7,159 |
| Total working expenses .. | 17,23,000 | 17,29,930 | 16,26,519 | 16,80,195 |

**Details of working expenses.**

11. The following table gives the details of working expenses for some of the principal works :—

| Name of work. | Average incidence of water rate per acre. | Cost of measurement. | | | | Working expenses in the Public Works Department. | |
|---|---|---|---|---|---|---|---|
| | | Total cost. | Per acre. | | | Per mile of canal. | Per acre irrigated. |
| | Rs. | Rs. | Rs. | a. | p. | Rs. | Rs. |
| Nira L. B. Canal & Shetphal tank .. | 9·55 | 1,126 | 0 | 0 | 4 | 911 | 3·04 |
| Pravara Canals .. .. | 15·13 | 1,397 | 0 | 1 | 1 | 1,129 | 7·46 |
| Girna Canal .. .. | 9·99 | 331 | 0 | 0 | 7 | 1,843 | 8·02 |
| Godavari Canals .. .. | 12·93 | 1,415 | 0 | 0 | 10 | 1,083 | 8·79 |
| Mutha Canals and Matoba Tank .. | 12·81 | 700 | 0 | 1 | 5 | 599 | 8·73 |
| Kadwa River Works .. .. | 8·90 | 152 | 0 | 0 | 8 | 927 | 9·26 |
| Nira Right Bank Canal .. .. | 10·85 | 542 | 0 | 0 | 4 | 960 | 11·47 |
| Mhaswad Tank .. .. | 4·73 | 65 | 0 | 0 | 8 | 298 | 11·74 |
| Krishna Canal .. .. | 7·74 | 254 | 0 | 0 | 9 | 944 | 6·03 |
| Yerla River Irrigation Works .. | 5·40 | 371 | 0 | 1 | 8 | 277 | 2·66 |
| Upper Man River Works.. .. | 5·35 | 50 | 0 | 0 | 11 | 287 | 6·01 |
| Jamda Canals .. .. | 6·36 | 24 | 0 | 0 | 4½ | 125 | 13·86 |
| Ekruk Tank .. .. | 6·00 | 246 | 0 | 1 | 3 | 374 | 4·18 |
| Maini Tank .. .. | 5·11 | 92 | 0 | 1 | 4 | 444 | 3·67 |
| Gokak Canal .. .. | 5·36 | 637 | 0 | 1 | 0 | 344 | 1·85 |
| Dharma Canal .. .. | 6·31 | 97 | 0 | 3 | 8 | 261 | 0·85 |

12. The gross assessed revenue, direct and indirect, amounted to Rs. 31,17,788 as compared with Rs. 33,83,235 in the previous year. The details of the gross assessment are as under :—

**Gross assessed revenue.**

| — | Direct revenue. | | | Indirect revenue. | Total. |
|---|---|---|---|---|---|
| | Water rate. | Other receipts. | Total. | | |
| | Rs. | Rs. | Rs. | Rs. | Rs. |
| Productive .. .. .. | 30,059 | 1,14,015 | 1,44,074 | 10,087 | 1,54,161 |
| Unproductive .. .. | 26,22,255 | 3,26,281 | 29,48,536 | 15,091 | 29,63,627 |
| Total .. | 26,52,314 | 4,40,296 | 30,92,610 | 25,178 | 31,17,788 |

The net assessed revenue of the year, after deducting working expenses (Rs. 16,80,195), amounted to Rs. 14,37,593 as compared with Rs. 17,56,716 during the previous year.

13. The following table gives the percentage return earned during the year on capital outlay on the principal works in operation :—

| — | Total capital outlay (direct and indirect). | Gross receipts (direct and indirect). | Working expenses (direct and indirect). | Net Revenue. | Percentage return on capital outlay. |
|---|---|---|---|---|---|
| | Rs. | Rs. | Rs. | Rs. | Rs. |
| Ekruk Tank .. | 13,40,386 | 1,26,816 | 17,980 | 1,08,836 | 8·12 |
| Hathmati and Khari Cut Canals .. .. | 13,18,729 | 55,205 | 37,909 | 17,296 | 1·31 |
| Nira Left Bank Canal and Shetphal Tank .. | 1,45,64,437 | 8,23,315 | 2,24,112 | 5,99,203 | 4·11 |
| Nira Right Bank Canal .. | 4,12,89,662 | 5,44,343 | 4,30,933 | 1,13,410 | 0·27 |
| Mutha Canals and Matoba Tank .. .. | 70,14,462 | 3,01,239 | 1,03,010 | 1,98,229 | 2·83 |
| Godavari Canals .. | 1,05,98,850 | 4,46,995 | 2,53,577 | 1,93,418 | 1·82 |
| Ghankapur Tank—Girna Canal .. .. | 20,56,431 | 75,734 | 73,726 | 2,008 | 0·10 |
| Kadwa River Works .. | 10,35,876 | 30,388 | 35,211 | —4,823 | .. |
| Pravara River Works .. | 1,50,62,474 | 4,79,547 | 2,96,881 | 1,82,666 | 1·21 |
| Mhaswad Tank .. | 20,96,016 | 32,313 | 19,757 | 12,556 | 0·60 |
| Lower Panjhra River Works .. .. | 4,68,621 | 26,446 | 4,817 | 21,629 | 4·62 |
| Krishna Canal .. | 9,49,807 | 49,893 | 33,279 | 16,614 | 1·75 |
| Gokak Canal .. | 14,71,883 | 71,838 | 17,834 | 54,004 | 3·67 |

14. The average water rates per acre of land actually irrigated were :—

| | Rs. |
|---|---|
| Productive works .. .. .. | 4·86 |
| Unproductive works .. .. .. | 7·57 |

15. The water rate assessments and other receipts compare with those of the previous year as under :—

| | 1937-38. | 1938-39. |
|---|---|---|
| | Rs. | Rs. |
| Water rates .. .. | 28,78,975 | 26,52,314 |
| Other receipts— | | |
| Plantations .. .. | 9,129 | 5,168 |
| Water power .. .. | 14,313 | 14,313 |
| Miscellaneous .. .. | 4,59,848 | 4,20,815 |
| Total .. | 4,83,290 | 4,40,296 |
| Share of land revenue .. | 20,970 | 25,178 |
| Grand Total .. | 33,83,235 | 31,17,788 |

16. The principal crop acreages irrigated during 1937-38 and 1938-39 are given below :—

**Crop acreages.**

| | 1937-38. | 1938-39. |
|---|---|---|
| | Acres | Acres |
| Garden and orchards .. | 7,502 | 7,012 |
| Sugarcane .. .. | 49,564 | 43,571 |
| Wheat .. .. | 11,062 | 9,956 |
| Rice .. .. | 20,920 | 8,397 |
| Jowar .. .. | 29,904 | 51,740 |
| Bajri .. .. | 15,484 | 12,364 |
| Gram, etc. .. .. | 17,081 | 14,518 |
| Groundnut .. .. | 29,256 | 19,926 |
| Cotton .. .. | 24,446 | 19,223 |
| Condiments .. .. | 9,542 | 9,297 |

The total estimated value of the crops irrigated was Rs. 265·88 lakhs as compared with Rs. 206·06 lakhs during the previous year.

# DETAILED REPORTS BY LOCAL OFFICERS.

## NORTHERN CIRCLE.

The year under review was marked by a poor monsoon which broke in the last week of May and ended by the end of August. The rainfall was below normal and of low intensity with the result that it was inadequate for rice crops and for storage. There was very little run-off from the catchments of the rivers. The little flow in the Hathmati River was utilised in filling up the reservoirs and tanks and for rice transplantation. The transplanted area was protected by canal water and brought to maturity. The surplus water was utilised to protect the crops in the Rabi and Hot weather seasons. The total area protected by irrigation under the Hathmati and Khari Cut Canals including the area in the Kalambandhi villages of the Khari sluices system was about 11,367 acres.

The rainfall gauged at Ahmedabad and at Prantij was 20·39 and 18·19 inches, respectively, as compared with 27·91 and 26·00 inches, the average precipitation, respectively, of the last three years. Similarly at Bareja, which is situated in the centre of the area irrigated by the Khari Cut Canal, the rainfall was 18·75 inches as compared with 24·74 inches, the average of the last three years. At Himatnagar, where the Head Works of the Hathmati Canal are situated, it was 20·04 inches as compared with 31·75 inches, the average of the past three years.

The principal irrigation works in operation in this Circle are (1) the Hathmati and Khari Cut Canals, (2) the Wangroli Tank, (3) the Savli Tank, (4) the Saiat Tank, (5) the Tranza-Nagrama Tanks and (6) the Futelao Tank.

No. (1) is a work which includes the Bokh Storage Reservoir with a capacity of 300 million cubic feet of water and several small tanks with small independent catchments depending on local rainfall. The other works are storage tanks all depending on local rainfall.

The six works are financially unproductive, as the annual revenue is not sufficient to cover the working expenses.

### AHMEDABAD AND KAIRA AND PANCH MAHALS DIVISIONS.

### HATHMATI AND KHARI CUT CANALS.

This is the most important canal system in Gujarat. The Hathmati Canal irrigates a tract of land lying between the Sabarmati and Khari rivers and this system in addition to irrigating the area dependent on it, is designed to pass surplus water, when available, first into the Bokh Reservoir and then into the Khari River direct via the Bhujwa Channel. The Bokh Reservoir does not provide any direct irrigational supplies but only acts as a storage reservoir for the Khari Cut Canal. Further downstream on the Khari River are situated two small irrigation systems and these utilise the natural flow of the river and also any surplus water

which can be made available from the Hathmati canal; the Khari water is abstracted at the so-called "Khari Sluices" for direct irrigational purposes, while the surplus water from the Hathmati is diverted through an artificial cut called "the Khari Cut" into a natural channel and this in its turn supplies a system of distributaries, several small tanks and the large Chandola Tank situated near Ahmedabad. The system was first opened in 1873-1874 and has cost more than Rs. 13 lakhs.

The Hathmati River was in flood on four occasions only due to poor rainfall in the catchment of the river. The floods were of short duration and of limited volume. The greatest depth of water over the weir crest was 0·90 feet on 24th June and 25th July 1938 when the discharge was 7,775 and 7,140 cusecs. The area irrigated under this canal was 1,270 acres in the Kharif season and 313 acres in the Rabi season. The average daily discharge admitted into the canal at its head during the Kharif season was 120 cusecs of which quantity only 73 cusecs were utilised for irrigation carried out under the canal, the balance being let down into the Bokh Reservoir and the Bhujwa Channel for supply to irrigation carried out under the Khari Cut Canal and for filling up the reservoirs and tanks situated thereunder. During the Rabi season an average daily discharge of 22 cusecs was obtained from the river, which was utilised for irrigational purposes.

The Khari River rose in flood moderately only twice in the earlier part of the season. The floods were of short duration and of little volume. The flood waters were not drawn into the Khari Cut Canal but were passed down to the Kalambandhi villages. Under this canal 3,938 acres were irrigated in the Kharif season and none in the Rabi season.

The area irrigated, the revenue assessed and the working expenses in connection with the Hathmati and Khari Cut Canals compare with the average of the three preceding years as under:—

| Year. | Kharif. | | Rabi. | | Total. | | Working expenses. |
|---|---|---|---|---|---|---|---|
| | Area irrigated. | Assess-ment. | Area irrigated. | Assess-ment. | Area irrigated. | Assess-ment. | |
| | Acres. | Rs. | Acres. | Rs. | Acres. | Rs. | Rs. |
| Average .. | 6,830 | 40,127 | 2,416 | 6,644 | 9,246 | 46,771 | 38,778 |
| 1938-39 .. | 5,208 | 15,874 | 313 | 676 | 5,521 | 16,550 | 37,909 |

The remissions sanctioned during the year amounted to Rs. 8,384. The gross revenue realised from all sources amounted to Rs. 52,988 while the working expenses were Rs. 37,909. These figures show a gross return of 1·4 per cent. on the total capital outlay of Rs. 13,18,729.

## FIRST CLASS IRRIGATION TANKS IN GUJARAT.

The five first class tanks, viz. Wangroli, Savli, Saiat, Tranza Nagrama and Futelao were constructed between the years 1904 and 1917 at the aggregate cost of Rs. 11 lakhs. They rarely yield any net return, as the demand for water from them is small in years of good rainfall, whereas in years of scarcity the tanks themselves store deficient supplies. The first four tanks are situated in Kaira Collectorate, while the last one is in the Broach and Panch Mahals Collectorate.

The area irrigated, the revenue assessed and the working expenses in connection with the tanks during the year are compared with the average of the preceding three years as below :—

| Name of Tank. | Year. | Kharif. | | Rabi. | | Total. | | Working expenses. |
|---|---|---|---|---|---|---|---|---|
| | | Area irrigated. | Assess-ment. | Area irrigated. | Assess-ment. | Area irrigated. | Assess-ment. | |
| | | Acres. | Rs. | Acres. | Rs. | Acres. | Rs. | Rs. |
| Wangroli .. | Average .. | 737 | 3,600 | 232 | 925 | 969 | 4,525 | 6,906 |
| | 1938–39 .. | 1,447 | 7,221 | 14 | 57 | 1,461 | 7,278 | 6,628 |
| Savli .. | Average .. | 847 | 4,203 | 42 | 161 | 889 | 4,364 | 5,652 |
| | 1938–39 .. | 488 | 2,570 | .. | .. | 488 | 2,570 | 5,360 |
| Saiat .. | Average .. | 294 | 1,221 | 91 | 369 | 385 | 1,590 | 3,479 |
| | 1938–39 .. | 610 | 2,384 | .. | .. | 610 | 2,384 | 3,300 |
| Tranza Nagrama | Average .. | 1 | 2 | 1 | 1 | 2 | 3 | 1,939 |
| | 1938–39 .. | .. | .. | 11 | 22 | 11 | 22 | 1,822 |
| Futelao .. | Average .. | 19 | 38 | 117 | 51 | 136 | 89 | 2,904 |
| | 1938–39 .. | .. | .. | 119 | 358 | 119 | 358 | 6,076 |

## WANGROLI TANK.

The rainfall gauged at the site of the tank was 28·76 inches. The tank was partially filled and the water was utilised in irrigating the Kharif and Rabi crops (mainly rice, wheat, and gram). The miscellaneous revenue realised during the year amounted to Rs. 1,194 compared with Rs. 1,019 received during the previous year. The remission of Rs. 21–10–0 was granted under this tank owing to failure of crops.

## SAVLI TANK.

The rainfall gauged at the site of the tank was 16·98 inches. The tank was very poorly filled and the water was utilised in irrigating Kharif crops

which were mainly rice. There was no Rabi irrigation. The miscellaneous revenue realised amounted to Rs. 624 compared with Rs. 1,122 received during the previous year. Remission of Rs. 512–12–0 was granted due to failure of crops.

## SAIAT TANK.

The rainfall gauged at the site of the tank was 28·64 inches. The tank was partially filled and the water was utilised in irrigating Kharif crops, mainly, rice. The miscellaneous revenue realised amounted to Rs. 970 compared with Rs. 946 received in the previous year. Remission of Rs. 140–15–0 was sanctioned due to failure of crops.

## TRANZA NAGRAMA TANKS.

The rainfall gauged at Tranza Nagrama was 23·76 inches. The tanks did not fill during the year and there was practically no irrigation in the Kharif and Rabi seasons. The miscellaneous revenue realised amounted to Rs. 531 compared with Rs. 1,317 received in the previous year.

## FUTELAO TANK.

The rainfall gauged at the site of the tank was 21·27 inches during the year. The tank was filled to F. S. L. but no irrigation was done during Kharif season owing to good rainfall. There was good Rabi irrigation. The miscellaneous revenue realised amounted to Rs. 28 compared with Rs. 20 received in the previous year. Extensions and improvements were carried at a cost of Rs. 3,993. The work is in progress.

The percentage returns obtained during the year from the working of these tanks are shown below :—

| Name of Tank. | Gross assess-ment. | Gross realisa-tion. | Less working expenses. | Net revenue. | Capital outlay direct and indirect to end of 1938-39. | Percent-age of return. |
|---|---|---|---|---|---|---|
| | Rs. | Rs. | Rs. | Rs. | Rs. | |
| Wangroli .. .. | 8,472 | 10,754 | 6,628 | 4,126 | 2,93,295 | 1·41 |
| Savli .. .. | 3,194 | 7,220 | 5,360 | 1,860 | 2,55,210 | 0·73 |
| Saiat .. .. | 3,384 | 3,956 | 3,300 | 656 | 1,84,029 | 0·36 |
| Tranza Nagrama .. | 553 | 531 | 1,822 | —1,291 | 2,80,635 | .... |
| Futelao .. .. | 386 | 75 | 6,076 | —6,001 | 1,16,461 | .... |

## DECCAN IRRIGATION CIRCLE.

The rainfall during the year under report was generally satisfactory on all the Canals in this Circle.

The general condition of the irrigated crops was satisfactory. There was improvement in the Gul rates during the year under report.

### SUGAR FACTORIES.

The following sugar factories have been established on the Deccan Canals and the acreages for which water is guaranteed at present is noted against each :—

| Name of sugar factory. | Annual guarantee of water supply for areas of sugarcane. | Capacity in tons per day. |
|---|---|---|
| | Acres. | |
| 1. The Belapur Company, Harigaon, Pravara Left Bank Canal. | 2,750 | 600 |
| 2. The Maharashtra Sugar Mills Limited near Belapur, Pravara Left Bank Canal. | 2,350 | 500 |
| 3. Messrs. Marsland Price and Company Limited at Kalamb, Nira Left Bank Canal. | 1,400 | 500 |
| 4. The Phaltan Sugar Works Limited near Tadavli, Nira Right Bank Canal. | 2,500 | 500 |
| 5. The Saswad Mali Sugar Factory Limited near Akluj, Nira Right Bank Canal. | 1,200 | 300 |
| 6. The Ravalgaon Sugar Farm Limited near Ravalgoan, Girna Canal. | 1,400 | 200 |
| 7. The Brihan Maharashtra Sugar Syndicate Ltd. .. | 1,250 | 450 |
| 8. Belwandi Sugar Farm near Visapur-Visapur Canal. | No guarantee in respect of area is given but ¾th of the water available in the Visapur tank is guaranteed annually. | 200 |

One more Sugar Factory has been allowed on the Godavari Left Bank Canal during the year under report which is under erection.

The areas of sugarcane planted by the sugar factories during the year were 16,248 acres.

A number of drainage projects to save lands from damage due to intensive cultivation of sugarcane by Sugar Companies has been prepared and construction work of some of these schemes was in progress during the year.

The total area irrigated in the Deccan Irrigation Circle during the year was 207,904 acres as compared with 2,35,811 acres during the previous year and the gross revenue amounted to Rs. 26·36 lakhs as compared with the figure of Rs. 27·50 lakhs for the previous year.

## NIRA CANALS DIVISION.

### Lloyd Dam at Bhatgar and Nira Right Bank Canal.

The Nira Right Bank Canal is the largest canal in the Deccan. The original estimate of the project framed in 1910 provided for :—

(1) The raising of the Dam at Bhatgar by 60 feet in order to increase its storage capacity from 5,300 million cubic feet to 24,000 million cubic feet ;

(2) The construction of a canal 109 miles long on the right bank of the Nira river having a capacity of 1,500 cusecs at head ; and

(3) The enlarging of the existing Nira Left Bank Canal in order to increase its discharge from 450 to 760 cusecs.

The total cost was estimated at about Rs. 258 lakhs and the area to be irrigated annually at 190,000 acres. The project was submitted to the Government of India in May 1911, sanctioned by the Secretary of State in June 1912 and the work was started in the same year. Before the work of raising the Bhatgar Dam was commenced, however, it was decided for technical reason to build an entirely new dam. Owing to this change and to the unprecedented rise in the cost of labour and materials due to the Great War, a revised estimate amounting to Rs. 491 lakhs was framed in 1920 and submitted to the Government of India in September 1921. The revised project provided for :—

(1) The construction of a new dam at Bhatgar designed to increase the storage from 5,300 million cubic feet to 24,000 million cubic feet;

(2) The construction of a canal 106½ miles long on the right bank of the Nira river ; and

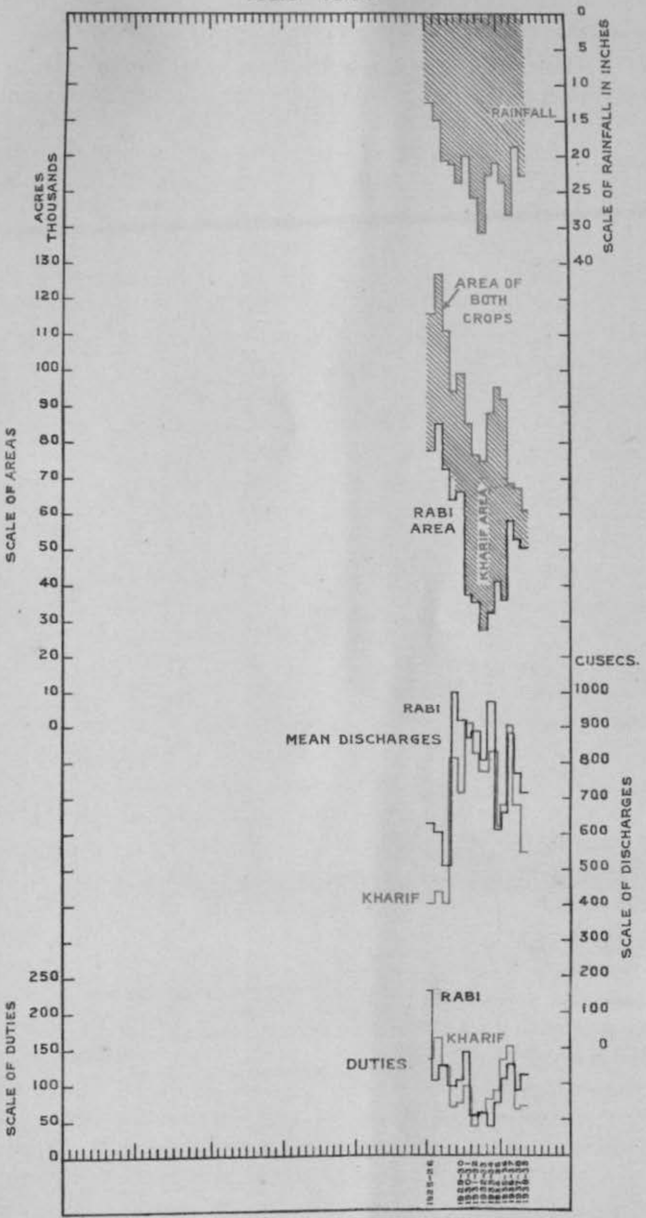
(3) The enlargement of the Nira Left Bank Canal, including the expenditure of Rs. 3¾ lakhs already incurred on widening the Nira Left Bank Canal.

It was anticipated that 132,000 acres would be irrigated annually as a result of this scheme and that the gross revenue would amount to Rs. 15·22 lakhs and the net revenue to Rs. 11·92 lakhs yielding a return of 2·4 per cent. on the capital outlay. The revised project was sanctioned by the Secretary of State in June 1922.

The Lloyd Dam at Bhatgar, 190 feet high, 5,333 feet long including the waste weir (4,266 feet long excluding the waste weir) and 124 feet wide at the base, was completed in 1928 at a cost of Rs. 172 lakhs. It is one of the largest dams in the world and contains 21½ million cubic feet of masonry. The lake formed by the construction of the dam has a length of 17 miles at full supply level with a corresponding storage capacity of 24,000 million cubic feet. The catchment area is 128 square miles in extent with an annual rainfall varying from 250 inches in the Ghats to 40 inches at Bhatgar. In addition to the sluices required for releasing water for irrigation purposes there are 81 waste weir gates for the control and regulation of the flood level in the lake.

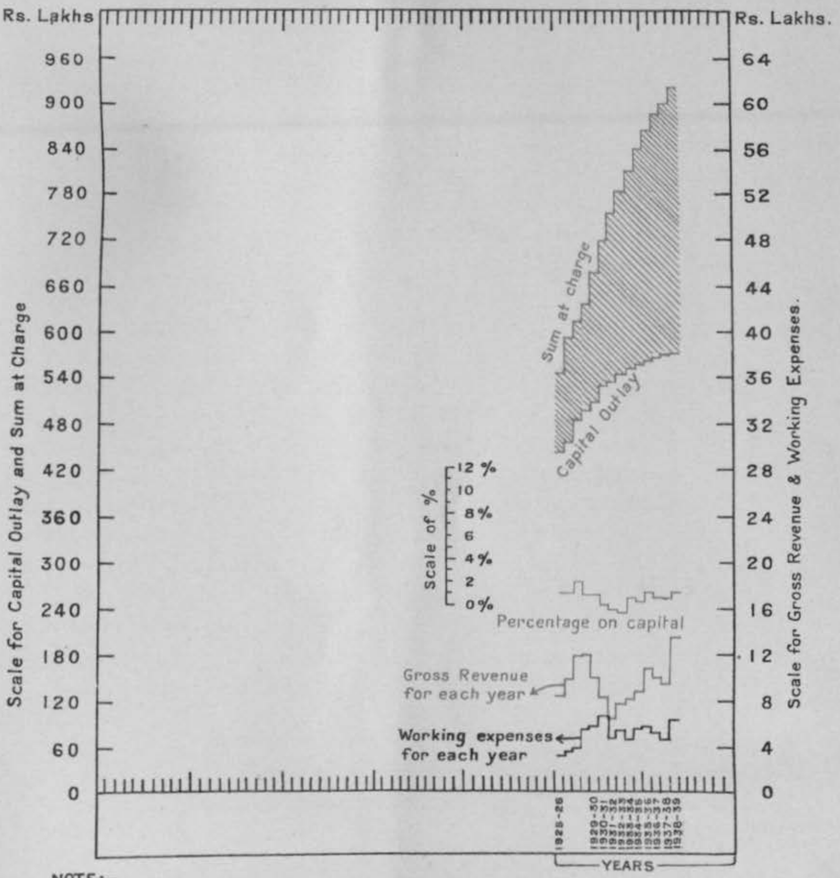
The Nira Right Bank Canal has its head works at Vir, 17 miles from the Lloyd Dam. The designed discharges of the canal at head and at tail are

# Working Record for Nira Right & Left Bank Canals 1925 - 1939




*C. G. KALE* 14-9-39
*EXECUTIVE ENGINEER,*
*NIRA CANALS DIVISION*

## FINANCIAL RECORD
FOR
## Nira Right & Left Bank Canals.
1925-1939




NOTE:—

*THE INTERCEPTS BETWEEN THE TWO RED LINES SHOW ARREARS OF INTEREST UNPAID UP TO END OF EACH YEAR, WHICH BEING ADDED TO THE CAPITAL, GIVE SUM AT CHARGE. THE INTERCEPTS BETWEEN THE BLACK & RED LINES SHOW THE NET INCOME EACH YEAR.*

*C.G.KALE* 14-9-39
*EXECUTIVE ENGINEER*
*NIRA CANALS DIVISION*

*(0) G.P.Z.O. POONA, 1939*

1,500 and 414 cusecs, respectively, the corresponding full supply depths being 8·5and 6·5 feet, respectively. The canalabout 106½ miles in length commands lands situated in the Satara and Sholapur Districts and the Phaltan State. Water was first supplied from the canal for the irrigation of rabi crops in 1924–25. The works on the main canal are completed. The Lloyd Dam was completed in the year 1928 and the Nira Right Bank Canal Project was completed in the year 1937–38. There are 3 branches and 69 distributaries taking off from the canal, while the culturable area commanded by it is 448,000 acres. The water regulation and distribution works on the canal are constructed on modern lines and the latest types of Standing Wave Flume measuring devices are provided at distributary heads on the channels. The whole of the perennial area under the canal has been surveyed and the soil classification carried out before designing the channels, while the lands suitable for perennial and other crops have been classified by the Irrigation Research Division and shown on maps.

On the 1st April, the level of the water in Lake Whiting at Bhatgar was 107·90 feet (full supply level 143 feet) above the sill of the sluices, the corresponding contents being 11,933 million cubic feet. The lowest level of 88·35 feet was reached on the 10th June, the corresponding contents being 6,583·13 million cubic feet. The lake began to fill subsequently and received replenishment up to its full supply level of 143 feet on the 7th September. Full supply level was maintained till the 25th October, when the draw-off for irrigation purposes commenced. On the 31st March 1939, the water level was at 108·40 feet, the corresponding contents being 12,084 million cubic feet. The rainfall gauged at Bhatgar during the year was 51·95 inches, while the rainfall in the Nira Right Bank canal tract averaged 23·56 inches and that on the Nira Left Bank Canal averaged 21·92 inches.

The following table gives the area irrigated, revenue assessed, etc., during the year as compared with the corresponding averages of the past three years :—

| Area irrigated. | | Water rates assessed. | | Gross assessed revenue. | |
|---|---|---|---|---|---|
| 1938–39. | Average. | 1938–39. | Average. | 1938–39. | Average. |
| Acres. | Acres. | Rs. | Rs. | Rs. | Rs. |
| 37,691 | 41,023 | 4,08,836 | 3,71,657 | 4,29,239 | 3,94,865 |

| Working expenses. | | Realisations. | | Rainfall. | |
|---|---|---|---|---|---|
| 1938–39. | Average. | 1938–39. | Average. | 1938–39. | Average. |
| Rs. | Rs. | Rs. | Rs. | Inches. | Inches. |
| 4,30,933 | 3,36,807 | 5,44,343 | 3,37,763 | 23·56 | 19·50 |

The decrease in the area irrigated was due to decrease in cane area. The increase in revenue was due to assessment of long-term overlapping cane. The area under sugarcane was 5,196 acres as compared with 7,883 acres in the previous year. The areas of sugarcane blocks and two-season blocks were 2,557 acres and 10,017 acres as compared with 2,730 acres and 10,451 acres, respectively, in the previous year. The area of garden and fruit blocks totalled 100 acres as compared with 94 acres of the previous year. The remissions sanctioned during the year amounted to Rs. 366.

The cost of the measuring establishment employed was pies 4 per acre as against pies 8 of the previous year. The expenditure incurred on maintenance and repairs amounted to Rs. 1,18,992. The perennial section of the Nira Right Bank Canal extended up to mile 79.

## Nira Left Bank Canal.

This canal forms part of the scheme known as the Nira Valley Development Project and irrigates lands situated on the left bank of the Nira river. It is one of the pioneer irrigation works in the Deccan and protects a tract in the Poona District, with a very precarious rainfall. The original scheme consisted of—

(*a*) A ghat-fed storage tank at Bhatgar (Lake Whiting) about 32 miles south of Poona on the Yelwandi river, impounding 5,300 million cubic feet of water ;

(*b*) A pick-up-weir at Vir on the Nira river about 17 miles downstream from Bhatgar ;

(c) A canal about 100 miles long irrigating about 80,000 acres annually ; and

(*d*) The Shetphal Tank at the tail of the canal with an effective capacity of 592 million cubic feet for the purpose of storing a portion of the surplus monsoon discharge.

The original masonry dam at Bhatgar, 127 feet high has since been replaced by the higher Lloyd Dam mentioned above. The original works were commenced in 1881 and the canal came into operation in 1885-86. The canal originally had a capacity of 456 cusecs but it has now been remodelled to carry a discharge of 720 cusecs. The canal, together with the tank, commands a gross area of 201,000 acres while the area commanded by the Shetphal Tank itself is 23,500 acres. The culturable area under the canal is 149,821 acres.

## Nira Valley Development Project.

This project was designed for the complete development of irrigation in the Nira Valley. It provided, *inter alia*, for the widening and remodelling of the Nira Left Bank Canal in order that the canal should irrigate an additional area of 19,000 acres of various types of crops and the construction of a new dam at Vir designed to supplement the storage of 24,000 million cubic feet impounded by the Lloyd Dam at Bhatgar. The construction of the Vir Dam, estimated to cost about a crore of rupees which was abandoned on the assumption that by economical distribution of the water available, the storage at Bhatgar would be sufficient to meet

all irrigation requirements of the Nira Valley, will however have to be reconsidered owing to the development of irrigation by the opening of sugar factories in the Valley. The remodelling of the Nira Left Bank Canal, which was started in the year 1925–26, has made considerable progress and the work is expected to be completed by the end of the year 1941–42. The expenditure incurred during the year amounted to Rs. 39,159.

The rainfall at Bhatgar was 51·95 inches as compared with 49·84 inches, of the previous year. The rainfall along the Nira Left Bank Canal was 21·92 inches. The water in the Shetphal Tank reached its lowest depth of 23·30 feet on the 23rd March 1938, the corresponding contents being 192 million cubic feet. The tank reached the full supply level of 37·50 feet on the 4th October 1938, the corresponding contents being 572·53 million cubic feet.

The following table gives the figures of area irrigated, revenue assessed, etc., during the year as compared with the averages of the previous three years :—

| Area irrigated. | | Water rates assessed. | | Gross assessed revenue. | |
|---|---|---|---|---|---|
| 1938–39. | Average. | 1938–39. | Average. | 1938–39. | Average. |
| Acres. | Acres. | Rs. | Rs. | Rs. | Rs. |
| 73,695 | 71,351 | 7,04,066 | 7,19,333 | 7,16,318 | 7,29,796 |

| Working expenses. | | Realisations. | | Rainfall. | |
|---|---|---|---|---|---|
| 1938–39. | Average. | 1938–39. | Average. | 1938–39. | Average. |
| Rs. | Rs. | Rs. | Rs. | Inches. | Inches. |
| 2,24,112 | 2,12,976 | 8,23,315 | 6,60,062 | 21·92 | 18·62 |

The area of sugarcane blocks was 13,028 acres on the Nira Left Bank Canal and that on the Shetphal Tank 1,495 acres compared with 14,729 and 1,570 acres, respectively, during the previous year, while the area under two-season blocks on the Nira Left Bank Canal was 22,628 acres and on the Shetphal Tank 1,335 acres compared with 21,457 and 1,401 acres, respectively. The cost incurred on the measuring establishment employed was 4 pies per acre—against pies 5 of the previous year. Remissions amounting to Rs. 1,820 and refunds up to the extent of Rs. 355

were sanctioned during the year under report. The cost of maintenance and repairs amounted to Rs. 78,397.

The perennial section of the Nira Left Bank Canal is up to mile 75 and that of the Shetphal Tank is up to mile 10 of the Shetphal Channel.

## MUTHA CANALS.

This system came into operation in 1874–75. The canals were constructed at a cost of about Rs. 65½ lakhs, including the cost of a large ghat-fed storage reservoir (Lake Fife) on the Mutha river at Khadakwasla, about 12 miles from Poona. The dam is 107 feet high, spanning the valley of the Mutha. The system comprises two canals, the Mutha Right Bank and Mutha Left Bank Canals, 70 and 18 miles long, respectively. The maximum designed discharges of the two canals at their heads are 412 and 38·5 cusecs, respectively. Both the canals take off direct from the lake, which has a storage capacity of 3,955 million cubic feet, of which 508 million cubic feet are reserved for the Poona Water Supply system as a margin of safety in the event of replenishment being received late. The storage is partly utilised for drinking and domestic purposes in Poona and partly for irrigation. The supply available for irrigation being insufficient the perennial limit of the Mutha Right Bank Canal is restricted to the reach between the head of the canal and mile No. 23⅝, i.e., up to and including Distributary No. 9. Even so the supply available in the lake is totally inadequate to meet the increasing demands on it and a project for increasing the storage is under consideration. The Matoba tank is a tail tank receiving the surplus supply of the canal during the monsoon months.

On 1st April, the level of water in Lake Fife was 20·95 feet above the sill of the canal sluices, the corresponding contents being 1,775 million cubic feet, as compared with 17·05 feet and 1,356 million cubic feet in the previous year. The lowest level reached was 11·40 feet above sill level on the 10th of June when replenishment commenced. The lake overflowed on the 14th June. The water in the lake remained at the full supply level of 34 feet (contents 3,643 million cubic feet) up to the 9th October 1938 and the draw off commenced from 26th October 1938. The run-off from the catchment of the lake (196 square miles) amounted to 57,884·40 million cubic feet. The level of water on the 31st March 1939 was 19·90 feet, the corresponding contents being 1,657 million cubic feet as compared with 21·05 feet and 1,787 million cubic feet, respectively, in the previous year. The rainfall at Khadakwasla was 40·60 inches as compared with 40·16 inches in the previous year. The Matoba tank dried up on the 15th February 1938. Replenishment from the Mutha Right Bank Canal commenced from the 17th June. The full supply level of the tank (29 feet) was reached on the 29th August 1938, the corresponding contents being 220·54 million cubic feet. The level of water of Lake Fife on the 31st March 1938 was 19·90 feet, the corresponding contents being 1,657 million cubic feet.

The following table gives the figures of area irrigated, revenue assessed, etc., during the year as compared with the averages of the previous three years :—

| Area irrigated. | | Water rates assessed. | | Gross assessed revenue. | |
|---|---|---|---|---|---|
| 1938–39. | Average. | 1938–39. | Average. | 1938–39. | Average. |
| Acres. | Acres. | Rs. | Rs. | Rs. | Rs. |
| 11,791 | 15,379 | 1,51,003 | 1,72,499 | 3,34,839 | 3,79,983 |

| Working expenses. | | Real[illegible]t | | Rainfall. | |
|---|---|---|---|---|---|
| 1938–39. | Average. | 1938–39. | Average. | 1938–39. | Average. |
| Rs. | Rs. | Rs. | Rs. | Inches. | Inches. |
| 1,03,010 | 97,403 | 3,01,239 | 3,85,298 | 26·47 | 19·97 |

The area cultivated under sugarcane was 2,030 acres as compared with 2,364 acres in the previous year. The area under two-season blocks on the Mutha Canals was 1,566 acres and that on Matoba Tank 1,752 acres as compared with 2,070 and 1,833 acres, respectively, in the previous year. The quantities of water supplied to the Poona Cantonment and Poona City Municipality during the year was 1,193 and 2,564 million gallons, respectively, as compared with 1,169 and 2,456 million gallons, respectively, in the previous year. The revenue assessed amounted to Rs. 47,765 and Rs. 1,15,423 respectively compared with Rs. 46,794 and Rs. 1,12,454 respectively, during the previous year. The cost incurred on the measuring establishment employed was equivalent to a figure of Re. 0–1–5 per acre against 11 pies in the previous year. The expenditure incurred on maintenance and repairs amounted to Rs. 33,711.

## Kasurdi Tank.

This tank which dried up on 8th November 1937 received its first replenishment on the 2nd June 1938 up to a level of 17·50 feet and dried immediately. Further replenishment was received on the 6th August and dried on 15th August 1938. Rain on 21st September and 1st October 1938 filled the tank to a level of 18·10 feet and it finally dried on 3rd December 1938. The tank is almost completely silted up and hence the irrigated area is small. The leasing out of the tank bed for cultivation is the main source of revenue and fetched Rs. 1,033 during the year under report.

## SHIRSUPHAL TANK.

On the 15th February 1938, the level of water in the tank was 19·15 feet, the corresponding contents being 83·38 million cubic feet. Replenishment was received on the 27th May. The highest level reached was 28·10 feet on the 2nd October 1938, the corresponding contents being 261·53 million cubic feet. The tank did not fill to its full supply level. The supply available was fully utilised for irrigation.

## BHADALWADI TANK.

On the 15th February 1938, the level of water in the tank was 26·80 feet the corresponding contents being 87·45 million cubic feet. The lowest level of 23·20 feet was recorded on the 27th May, the corresponding contents being 54·32 million cubic feet. The full supply level of 35·70 feet was reached on the 15th September, the corresponding contents being 190·73 million cubic feet.

The following table gives the figures of area irrigated, revenue assessed, etc., during the year as compared with the averages of the past three years :—

| Name of tank. | Area irrigated. | | Water rates. | | Gross assessed revenue. | |
|---|---|---|---|---|---|---|
| | 1938–39. | Average. | 1938–39. | Average. | 1938–39. | Average. |
| | Acres. | Acres. | Rs. | Rs. | Rs. | Rs. |
| Kasurdi .. .. | 64 | 23 | 151 | 61 | 1,125 | 1,193 |
| Shirsuphal .. .. | 1,068 | 897 | 5,063 | 4,704 | 5,476 | 5,164 |
| Bhadalwadi .. .. | 1,249 | 1,130 | 6,082 | 5,883 | 6,292 | 6,034 |

| Name of tank. | Working expenses. | | Realisations. | | Rainfall. | |
|---|---|---|---|---|---|---|
| | 1938–39. | Average. | 1938–39. | Average. | 1938–39. | Average. |
| | Rs. | Rs. | Rs. | Rs. | Inches. | Inches. |
| Kasurdi .. .. | 1,086 | 1,021 | 1,028 | 1,247 | 21·50 | 13·20 |
| Shirsuphal .. .. | 3,338 | 2,882 | 4,300 | 6,238 | 25·14 | 16·57 |
| Bhadalwadi .. .. | 3,331 | 3,487 | 4,084 | 5,748 | 47·35 | 24·15 |

## NASIK IRRIGATION DIVISION.

### Godavari Canals.

This is one of the major irrigation works undertaken in the Deccan for the protection of areas liable to famine. It was started in 1907 and completed in 1915–16 at a cost of about 1 crore of rupees. The system comprises—

(1) A storage reservoir (Lake Beale) on the Darna River, a tributary of the Godavari, situated about 20 miles from Nasik ;

(2) A pick-up-weir at Nandur-Madhmeshwar on the Godavari 47 miles below the Darna Dam, which impounds the water released from the storage reservoir ; and

(3) Two canals, the Right Bank Canal, 69 miles long, which serves the northern tracts of the Ahmednagar District and the Left Bank Canal, 48 miles long, which irrigates lands north of the Godavari in the Nasik and Ahmednagar Districts.

The length of the Darna Dam (inclusive of its waste weir) exceeds a mile and the dam has a maximum height of 92 feet above its lowest foundation level. The lake has a storage capacity of 7,763 million cubic feet and the cost of the dam was Rs. 34·27 lakhs. The catchment area is 156 square miles. The weir at Nandur-Madhmeshwar is a work of considerable magnitude, its length being 3,618 feet inclusive of the Right and Left Bank Canal regulators. It has a maximum height of 34 feet above the level of the river bed. Scouring sluices have been constructed close to the head regulators of the two canals with the object of keeping the approach channels to the latter clear of silt. The total area under the command of the canals is 232,390 acres. The two canals (Right Bank and Left Bank) are designed to discharge 384 and 228 cusecs at their heads, respectively, with full supply depths of 7 feet and 6 feet, respectively.

On the 1st April, the level of water in the lake was 52·40 feet, the corresponding contents being 4,169 million cubic feet. The lowest level of 39·60 feet was reached on the 9th June, the contents being 2,082 million cubic feet, when the lake began to receive replenishment, until it over-flowed on the 22nd June. The draw-off for irrigation purposes commenced on the 17th October with a water level of 65 feet, the corresponding contents being 7,763 million cubic feet. On the 31st March 1939, the level of water was 66·50 feet, the corresponding contents being 7,763 million cubic feet. The perennial limit of the Right Bank Canal is up to mile 69 and that of the Left Bank Canal up to 42 miles. The average rainfall in the catchment area of the lake was 111·77 inches.

The following table gives the figures of area irrigated, revenue assessed, etc., during the year as compared with the corresponding averages of the past three years :—

| Name of work. | Area irrigated. | | Water rates assessed. | | Gross assessed revenue. | |
|---|---|---|---|---|---|---|
| | 1938–39. | Average. | 1938–39. | Average. | 1938–39. | Average. |
| | Acres. | Acres. | Rs. | Rs. | Rs. | Rs. |
| Lake Beale .. .. | 448 | 474 | 1,498 | 1,649 | 4,01,759 | 4,23,461 |
| Godavari Right Bank Canal. | 17,899 | 20,238 | 2,28,273 | 2,28,262 | | |
| Godavari Left Bank Canal. | 10,953 | 13,973 | 1,49,039 | 1,65,711 | | |

| Name of work. | Working expenses. | | Realisations. | | Rainfall. | |
|---|---|---|---|---|---|---|
| | 1938–39. | Average. | 1938–39. | Average. | 1938–39. | Average. |
| | Rs. | Rs. | Rs. | Rs. | Inches. | Inches. |
| Lake Beale .. .. | 2,53,577 | 3,20,285 | 4,46,995 | 3,37,254 | .. | .. |
| Godavari Right Bank Canal | | | | | 27·91 | 20·19 |
| Godavari Left Bank Canal | | | | | 27·26 | 18·22 |

The decrease in the area irrigated and the assessed revenue was due to cancellation of sugarcane blocks and less demand for water due to satisfactory rainfall. The area of sugarcane blocks was 12,845 acres as compared with 15,836 acres in the previous year. The area of two seasonal blocks was 2,446 acres against 2,842 in the previous year. The cost of the measuring establishment employed was 10 pies per acre against 14 pies as was obtained last year. The remissions sanctioned during the year amounted to Rs. 1,090. The cost incurred on maintenance and repairs amounted to Rs. 97,768.

## Chankapur Tank—Girna Canal.

This is comparatively small irrigation system situated in the Nasik District having its storage reservoir at Chankapur fed from a catchment of 100 square miles in extent and its pick-up-weir at Thengoda situated further downstream on the Girna river, from which weir the Girna canal (19 miles in length) takes off. The tank is situated on the Girna river, a tributary of the Tapti and has been formed by the construction of a masonry dam 140 feet high, which impounds 1,500 million cubic feet of water. The dam and the canal (up to mile 13) were completed in 1909–10 and the canal has been in operation since then. The extension of this canal designed to carry about 40 cusecs, up to mile 19 was completed in 1920–21. The designed discharge of the canal at its head is 90 cusecs and at its tail 15 cusecs, the corresponding full supply depth being 4½ feet and

2 feet, respectively. The total area under the command of the canal is 29,182 acres and the irrigable area is 8,500 acres.

On the 1st April, the level of water in the tank was 78·05 feet, the corresponding contents being 866 million cubic feet. The lowest level of 66 feet was reached on the 26th May (contents 524 million cubic feet) when the lake began to receive replenishment, until it overflowed on the 25th June (the full supply depth being 92 feet), the corresponding contents being 1,535 million cubic feet. The first draw off for irrigation purposes commenced on the 18th December with the level of water at 87·85 feet, the corresponding contents being 1,290 million cubic feet. On the 31st March 1939, the level of water was 82·40 feet, the contents then being 1,039 million cubic feet.

The following table gives the figures of area irrigated, revenue assessed, etc., during the year as compared with the averages of the past three years :—

| Area irrigated. | | Water rates assessed. | | Gross assessed revenue. | |
|---|---|---|---|---|---|
| 1938-39. | Average. | 1938-39. | Average. | 1938-39. | Average. |
| Acres. | Acres. | Rs. | Rs. | Rs. | Rs. |
| 8,919 | 10,551 | 89,062 | 1,02,230 | 90,555 | 1,04,644 |

| Working expenses. | | Realisations. | | Rainfall. | |
|---|---|---|---|---|---|
| 1938-39. | Average. | 1938-39. | Average. | 1938-39. | Average. |
| Rs. | Rs. | Rs. | Rs. | Inches. | Inches. |
| 73,726 | 50,015 | 75,734 | 8,599 | 32·88 | 21·19 |

The decrease in the area irrigated was due to less demand for water due to good rains. The decrease in the assessed revenue was partly due to the sugarcane of the Company being charged at Rs. 28 per acre as the applications are now submitted in the Company's name. The cane area was 1,767 acres as compared with 1,457 acres in the previous year. The cost of measuring establishment was equivalent to 7 pies per acre as compared with 11 pies obtained during the previous year. The remissions sanctioned during the year amounted to Rs. 72. The expenditure incurred on maintenance and repairs amounted to Rs. 28,508.

## Kadwa River Works.

These works, which came into operation in 1868–69, consist of three small canals, viz., the Palkhed, the Ojhar Tambet and the Wadali, taking off from weirs constructed across the Kadwa river and its tributary the

Banganga. The system comprises 38 miles of canals and distributaries. The storage reservior is at Waghad (a ghat-fed storage) situated on the Kolwan river in the Nasik District. The catchment of the tank is 29 square miles in extent. The tank is remarkable for the size of its earthen dam, which has a maximum height of 96 feet. The designed discharges of the Palkhed canal at its head and at its tail are 90 cusecs and 15 cusecs, respectively, the corresponding depths at full supply being 4½ feet and 2 feet. The designed discharges of the Ojhar Tambet canal at its head and at its tail are 33 cusecs and 5 cusecs, respectively, the depths at full supply being 3 feet and 1 foot, respectively. The designed discharges of the Wadali canal at its head and at its tail are 19 cusecs and 5 cusecs, respectively, the depths at full supply being 2 feet and 1 foot, respectively.

On the 1st April, the level of water in the tank was 38·10 feet above the sill, the corresponding contents being 257 million cubic feet. On the 26th May the level of water fell to 28·20 feet, when the lake began to receive replenishment until it overflowed on the 25th June 1938. The draw-off for irrigation purposes commenced on the 31st October with a water level of 48 feet, the corresponding contents being 521 million cubic feet. On the 31st March 1939 the level of water was 40·95 feet, the corresponding contents being 319·9 million cubic feet.

The following table gives the figures of area irrigated, revenue assessed, etc., during the year as compared with the averages of the past three years :—

| Name of Canal. | Area irrigated. | | Water rates assessed. | | Gross revenue assessed. | |
|---|---|---|---|---|---|---|
| | 1938–39. | Average. | 1938–39. | Average. | 1938–39. | Average. |
| | Acres. | Acres. | Rs. | Rs. | Rs. | Rs. |
| Palkhed Canal .. | 2,071 | 2,290 | 16,631 | 19,161 | 33,988 (for all three canals) | 41,332 |
| Ojhar Tambat Canal .. | 991 | 1,122 | 8,861 | 10,627 | | |
| Wadali Canal .. | 632 | 886 | 7,394 | 9,277 | | |

| Name of Canal. | Working expenses. | | Realisations. | | Rainfall. | |
|---|---|---|---|---|---|---|
| | 1938–39. | Average. | 1938–39. | Average. | 1938–39. | Average. |
| | Rs. | Rs. | Rs. | Rs. | Inches. | Inches. |
| Palkhed Canal .. | 35,211 (for all three canals) | 27,867 | 30,338 | 28,767 | 42·96 | 22·97 |
| Ojhar Tambat Canal .. | | | | | 33·66 | 21·55 |
| Wadali Canal .. | | | | | 51·02 | 21·13 |

The decrease in the area irrigated and assessed revenue was due to less demand for kharif and rabi crops due to good rainfall. The expenditure on maintenance and repairs amounted to Rs. 11,855.

The cost incurred on the measuring establishment employed was 8 pies per acre as against 12 pies for the previous year. Remissions sanctioned during the year amounted to Rs. 3,567.

## AHMEDNAGAR DIVISION.

### PRAVARA RIVER WORKS.

This canal system, which was constructed at a cost of Rs. 1½ crores, comprises :—

(1) The Wilson Dam at Bhandardara on the Pravara river. This dam which impounds the water of the Lake Arthur Hill, is one of the highest dams in the world having a height of 282 feet. It is 1,600 feet in length and the lake formed by the dam has a storage capacity of some 12,092 million cubic feet.

(2) A pick-up-weir, 890 feet long, situated at Ojhar, 53 miles downstream from Lake Arthur Hill, and about 8 miles east of Sangamner ; and

(3) Two canals, the Pravara Right Bank Canal, 33 miles long, and the Pravara Left Bank Canal, 48 miles long, which take off at their weir at Ojhar.

These canals irrigate lands in the Ahmednagar District and command an area of 228,720 acres. The designed discharges of the two canals (Pravara Right and Left Bank Canals) at head are 152 and 530 cusecs, respectively, the corresponding full supply depths being 5 feet and 8 feet. The work of remodelling the first 16½ miles of the Pravara Left Bank Canal and the Northern Branch has almost been completed in order to meet the increased demand for water from the sugar factories established on the Left Bank Canal and the work of remodelling Distributaries Nos. 8 and 9 and Water Course Nos. 32, 33 and 34 of the Pravara Left Bank Canal was started. With the remodelling of the canal and the rotational running now practised weeds do not appear at present. The Ojhar weir has been raised by two feet for additional storage. The height of the waste weir at Bhandardara was raised by 2·5 feet by constructing a crest wall. The construction of the Wilson Dam, which impounds the water of Lake Arthur Hill, was commenced in 1911 and completed in 1926. The catchment area of the lake is 47 square miles ; it is situated in the ghats and has an assured run-off. The dam is designed to impound a maximum depth of water of 270 feet and is constructed across a gorge in the valley of the Pravara river. At present water is impounded to a depth of 262·5 feet giving a storage of 10,557 million cubic feet and this could be increased to

12,092 million cubic feet with a corresponding depth of 270 feet by the erection of automatic gates on the waste weir or by the construction of syphon spillways and the raising of the waste weir.

On the 1st April, the level of water in the lake was 228·60 feet, the corresponding contents being 5,637 million cubic feet. The lowest level of 197·60 feet was reached on the 10th June, the contents being 3,036 million cubic feet. Replenishment commenced with effect from the 11th June and the full supply level of 262·5 feet was reached on the 22nd July, the contents being 10,908 million cubic feet. The maximum flood occurred on the 23rd July, when the level was 264·5 feet, which lasted for about 12 hours. The full supply level was maintained till the 18th September 1938 and the draw off for irrigation purposes commenced on this date. The level of water gradually fell to 240 feet on the 15th February, the contents being 7,006 million cubic feet. The level of water on the 31st March 1939 was 228·25 feet, the corresponding contents being 5,599 million cubic feet. The yield from the catchment (47 square miles) of the lake was 20,235·03 million cubic feet while the average rainfall of the several raingauge stations was 171 inches. The rainfall was generally satisfactory.

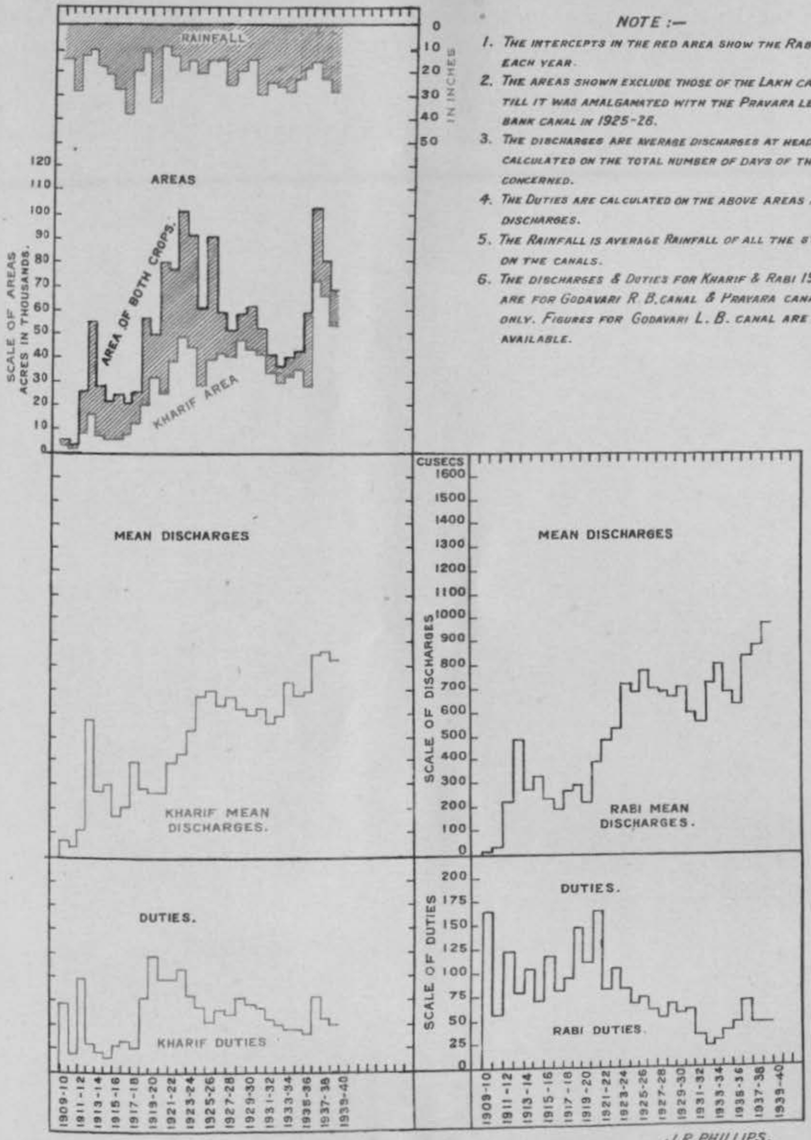
The following table gives the figures of area irrigated, revenue assessed, etc., during the year as compared with the averages of the past three years :—

| Name of work. | Area irrigated. | | Water rates assessed. | | Gross assessed revenue. | |
|---|---|---|---|---|---|---|
| | 1938–39. | Average. | 1938–39. | Average. | 1938–39. | Average. |
| | Acres. | Acres. | Rs. | Rs. | Rs. | Rs. |
| Pravara Right Bank Canal. | 7,778 | 9,723 | 99,140 | 1,20,537 | 1,02,928 | 6,02,642 |
| Pravara Left Bank Canal .. | 31,992 | 31,840 | 5,02,769 | 4,71,403 | 5,09,954 | |

| Name of work. | Working expenses. | | Realisations. | | Rainfall. | |
|---|---|---|---|---|---|---|
| | 1938–39. | Average. | 1938–39. | Average. | 1938–39. | Average. |
| | Rs. | Rs. | Rs. | Rs. | Inches. | Inches. |
| Pravara Right Bank Canal. | 2,96,881 | 3,59,957 | 4,79,547 | 5,83,834 | 28·50 | 20·16 |
| Pravara Left Bank Canal .. | | | | | 31·66 | 21·26 |

The increase in the area irrigated and the irrigation assessment on the Pravara Left Bank Canal was due to more irrigation of sugarcane by

## AHMEDNAGAR DIVISION
### GODAVARI & PRAVARA CANALS
### COMBINED WORKING RECORD.
### FOR THE YEARS 1910–39

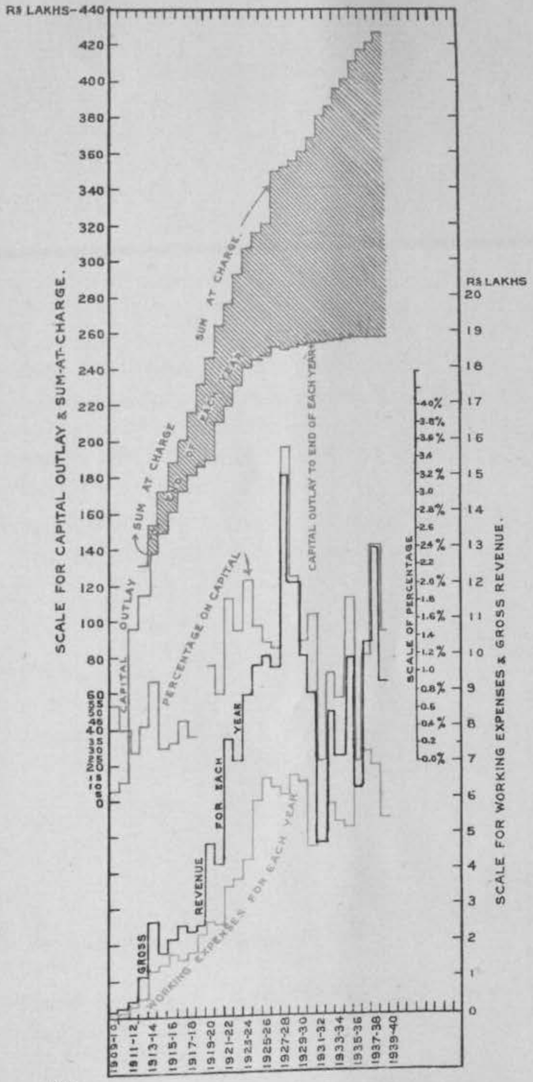



*NOTE :—*

1. The intercepts in the red area show the Rabi areas each year.
2. The areas shown exclude those of the Lakh canal till it was amalgamated with the Pravara Left Bank canal in 1925-26.
3. The discharges are average discharges at head calculated on the total number of days of the season concerned.
4. The Duties are calculated on the above areas and discharges.
5. The Rainfall is average Rainfall of all the stations on the canals.
6. The discharges & Duties for Kharif & Rabi 1912-13 are for Godavari R. B. canal & Pravara canals only. Figures for Godavari L. B. canal are not available.

J.R. PHILLIPS. 14-9-39
*Executive Engineer,*
*Ahmednagar Division.*

## AHMEDNAGAR DIVISION
## GODAVARI & PRAVARA CANALS
### COMBINED FINANCIAL RECORD.
FOR THE YEARS 1910 – 39




*N.B.*

*THE INTERCEPTS BETWEEN THE TWO RED LINES SHOW ARREARS OF INTEREST UNPAID UPTO END OF EACH YEAR, WHICH BEING ADDED TO THE CAPITAL, GIVES SUM AT CHARGE.*

*THE INTERCEPTS BETWEEN THE GREEN & BLACK LINES SHOW THE NET INCOME EACH YEAR.*

| NAME OF CANAL | CONSTRUCTION COMMENCED IN. | CANAL WAS OPENED IN. |
|---|---|---|
| GODAVARI CANALS. | 1907 | 1911 – 12 |
| PRAVARA CANALS. | 1909 | 1909 – 10 |

*J. R. PHILLIPS.*
*14-9-39*
*EXECUTIVE ENGINEER.*
*AHMEDNAGAR DIVISION*

G.P.Z.O. Poona, 1939.

the sugar companies. The total area of sugarcane blocks was 6,526 acres while the area under two-seasonal blocks was 926 acres as compared with 8,926 acres and 486 acres, respectively, in the previous year. The remissions sanctioned during the year amounted to Rs. 4,459. The cost of the measuring establishment was equivalent to 13 pies per acre as compared with the figure of 11 pies of the previous year. The expenditure incurred on maintenance and repairs to the Wilson Dam and the two canals amounted to Rs. 84,046.

## BHATODI TANK.

This is a small tank situated on the Mehekri river about 12 miles from Ahmednagar. It depends entirely on local rains for its supply. Due to silting, the storage capacity of the tank has been reduced from 154 million cubic feet to about 40 million cubic feet. The first replenishment was received on 12th May, which raised the level of water to 19·40 feet. The highest level of 26 feet was reached on 4th July, and the waste weir overflowed to a depth of 3·50 feet. The lowest level in the tank was 20·80 feet on the 14th February 1939.

The following table gives the figures of area irrigated, revenue assessed, etc., during the year as compared with the averages of the past three years :—

| Area irrigated. | | Water rates assessed. | | Gross assessed revenue. | |
|---|---|---|---|---|---|
| 1938-39. | Average. | 1938-39. | Average. | 1938-39. | Average. |
| Acres. | Acres. | Rs. | Rs. | Rs. | Rs. |
| 663 | 648 | 3,169 | 3,319 | 4,387 | 4,417 |

| Working expenses. | | Realisations. | | Rainfall. | |
|---|---|---|---|---|---|
| 1938-39. | Average. | 1938-39. | Average. | 1938-39. | Average. |
| Rs. | Rs. | Rs. | Rs. | Inches. | Inches. |
| 2,664 | 2,561 | 5,635 | 5,937 | 40·69 | 18·98 |

The area of two-seasonal blocks was 439 acres. No remissions were sanctioned during the year under report. The expenditure incurred on maintenance and repairs during the year amounted to Rs. 1,018.

# CENTRAL CIRCLE.

## SATARA DIVISION.

The area irrigated, the gross assessed revenue and the working expenses of the 6 works mentioned below as compared with the averages of the preceding three years, are given in the following statement :—

| Name of work. | Area irrigated. | | Gross assessed revenue. | | Working expenses. | |
|---|---|---|---|---|---|---|
| | 1938–39. | Average. | 1938–39. | Average. | 1938-39. | Average. |
| | Acres. | Acres. | Rs. | Rs. | Rs. | Rs. |
| 1. Krishna Canal .. | 5,516 | 4,140 | 43,003 | 55,009 | 33,279 | 28,026 |
| 2. Rewari Canal .. | 732 | 527 | 4,218 | 3,327 | 1,810 | 2,529 |
| 3. Upper Man River Works. | 837 | 933 | 4,524 | 5,397 | 5,033 | 8,561 |
| 4. Yerla River Irrigation Works. | 3,475 | 3,237 | 19,591 | 19,482 | 9,261 | 10,393 |
| 5. Chikhli Canal .. | 318 | 346 | 2,653 | 2,623 | 1,265 | 1,340 |
| 6. Maini Tank .. | 1,121 | 1,406 | 6,382 | 7,031 | 4,112 | 4,286 |

### KRISHNA CANAL.

The total rainfall gauged at Retre Budruk, which is situated in the centre of the canal tract, was 26·69 inches, as compared with the average of 26·23 inches for the past three years. Water could not be made available for sugarcane beyond mile 16/4 of the canal, as its discharging capacity has been considerably reduced owing to the accumulation of silt. The work of silt clearance is in progress now.

### REWARI CANAL.

The rainfall gauged at Rewari, which is situated one mile below the bandhara, was 28·28 inches, as compared with 23·15 inches, the average of the preceding three years. There was more demand for canal water, as the rainfall was insufficient during the rabi season.

### UPPER MAN RIVER WORKS.

*(Pingli Tank.)*

On the 1st April, the level of the tank was at R. L. 2359·24 equivalent to a storage of 26·76 million cubic feet. The first replenishment was received on the 4th August when the water level rose to R. L. 2365·89

which was equivalent to a storage of 86·27 million cubic feet. Further substantial replenishments were received during the monsoon with the result that the waste weir overflowed on 20th September, when the R. L. stood at 2371·39. The draw off began from the 6th November. The rainfall gauged at Gondawla, which is situated 3 miles below the tank, was 22·45 inches compared with 18·88 inches, the average of the preceding three years.

## Yerla River Irrigation Works.

### (*Nehr Tank.*)

On the 1st April, the R. L. in the tank was 2661·44 equivalent to a storage of 286·64 million cubic feet. The supply was utilised for hot weather irrigation. The first replenishment was received on the 22nd May, which raised the water level to R. L. 2660·30 equal to 260·09 M.cft. Another replenishment was received on the 15th June which raised the level to R. L. 2662·56, *i.e.*, equivalent to 314·12 million cubic feet. The highest level was reached during the year on the 20th September when the R. L. was 2666·62 and water began to flow over the waste weir. The draw off began on 14th November. The rainfall gauged at Nehr was 28·31 inches as compared with 26·65 inches, the average of the preceding three years.

## Chikhli Canal.

On the 1st April, the level of the water in the river was 0·3 ft. The first flood, which occurred on the 10th June raised the level by 2 feet. The waste weir overflowed on 4th August. The rainfall gauged at Chikhli was 19·75 inches compared with 17·26 inches, the average of the preceding three years.

## Maini Tank.

On the 1st April, the tank was dry and it remained so until the first replenishment was received on the 22nd May when the R. L. rose to 2299·22 equivalent to a storage of 10·82 million cubic feet. Subsequent replenishments were received on 2nd and 6th July raising the level to R. L. 2304·52 and the waste weir then began to overflow. The highest level reached during the year was on the 4th July, when the R. L. stood at 2305·02. The draw off began on 9th November. The rainfall gauged at Maini was 26·01 inches as compared with 19·97 inches, the average of the preceding three years.

## SHOLAPUR DIVISION.

The area irrigated, the gross assessed revenue and the working expenses of the tanks in the Sholapur Division, as compared with the corresponding

averages of the preceding three years, are given in the following statement :—

| Name of work. | Area irrigated. | | Gross assessed revenue. | | Working expenses. | |
|---|---|---|---|---|---|---|
| | 1938-39. | Average. | 1938-39. | Average. | 1938-39. | Average. |
| | Acres. | Acres. | Rs. | Rs. | Rs. | Rs. |
| Ekruk Tank .. | 4,296 | 3,884 | 1,38,218 | 1,45,101 | 17,980 | 18,839 |
| Koregaon Tank .. | 504 | 292 | 2,622 | 1,578 | 1,965 | 1,865 |
| Ashti Tank .. | 2,865 | 3,247 | 18,011 | 20,326 | 9,638 | 37,095 |
| Pathri Tank .. | 657 | 634 | 11,725 | 11,759 | 3,296 | 3,541 |

## Ekruk Tank.

The Ekruk Tank, situated near Sholapur, which came into operation in the year 1872–73, is an artificial reservoir formed by the construction of a large earthen embankment 7,000 feet long and having a maximum height of 76 feet. It supplies water not only for irrigational purposes but also to the town of Sholapur, the mills in Sholapur and the Great Indian Peninsula Railway for non-irrigational purposes. Under unfavourable conditions of replenishment, which occur periodically, the supply available from the tank is not sufficient to meet all the demands which arise, and the question of providing a supplementary storage is under consideration.

On the 1st April, the level of the water in the tank was 30·61 feet above the sill of the outlet. The storage available on the 31st May was found sufficient to admit of cultivation of 600 acres of hot weather and 1,000 acres of monsoon crops in addition to 180 acres of cane. The tank received good replenishments during the monsoon. Water applications for 2,700 acres were sanctioned for Rabi area inclusive of 1,060 acres of leased area. The highest level of water reached was 1523·60 on 24th September. The mean rainfall gauged at the five stations in the catchment area of the tank was 31·57 inches as compared with 20·77 inches, the average of the preceding three years, and the total replenishment received amounted to 1623·63 million cubic feet. The waste weir at R. L. 1521·60 overflowed on 19th July.

## Koregaon Tank.

On the 1st April, the level of the water in the tank was below the sill of the outlet. Hence water was not available for kharif crops. The tank received replenishments between June and September and all the available water was utilised for rabi crops. The waste weir overflowed on 23rd September. The highest level ... occurred

on the 1st October was R. L. 96·38. The rainfall recorded was 35·19 inches as compared with 22·58 inches, the average of the preceding three years.

## ASHTI TANK.

On the 1st April, the level of the water in the tank was below the sill of the outlet. Hence water was not available for Kharif crops. The highest level was reached during the year on the 2nd October when the level was at R. L. 226·79. With the replenishments received during the monsoon there was sufficient water in the tank to meet the requirements of the rabi season. The mean rainfall gauged at the two stations situated in the catchment was 27·65 inches as compared with the average of 18·30 inches for the preceding three years.

## PATHRI TANK.

The tank supplies water to the town of Barsi and the mill industries, as well as for irrigational purposes. On the 1st April, the level of the water in the tank was 24·70 feet above the sill of the outlet. The tank received good replenishments in the months of June and July. The waste weir was overflowing on 22nd June. The highest level reached during the year was 243·36 on the 7th July. The supply was thus sufficient to meet the requirements of irrigation and the Municipality. The mean rainfall gauged at the two stations, situated in the catchment area was 40·93 inches as compared with 27·29 inches, the average of the preceding three years.

## MHASWAD TANK.

This irrigation tank is formed by an earthen dam built across the Man river, the dam being 9,000 feet long and 80 feet high at its highest point. The tank, which is situated on the eastern border of the Satara District, has a storage capacity of 2,602 million cubic feet and supplies water for the irrigation of lands situated mostly in the Sholapur District. Owing to the precarious nature of the rainfall received in the catchment area the supply is not reliable. The tank is provided with a masonry overflow waste weir. The project was commenced in 1876–77 and completed in 1888–89. There is only one canal taking off from the left flank of the dam, previously called Mhaswad Canal No. 1 and now termed Mhaswad Canal, Part I. The designed discharge of the canal is 180·7 cusecs, whereas the present actual discharge is about 146 cusecs with a full supply depth of 4 feet. The Nira Right Bank Canal cuts across the Mhaswad Canal at mile 15 and the old Mhaswad Canal has been remodelled to function as Branch III of the Nira Right Bank Canal passing a discharge of 300 cusecs. No water from the Nira Right Bank Canal is now available for Branch III of the Nira Right Bank Canal system and the irrigation on this branch is being carried out with water obtained from the Mhaswad Tank but the supply is always insufficient to meet the full demand. Hence water from the Nira Right Bank Canal has to be borrowed so as to meet the demand of the irrigators.

On the 1st April, the level of water in the tank was 17·90 feet above the sill of the outlet. The tank received replenishments from July to October. The waste weir overflowed on 7th August. The available supply was utilised in meeting the Kharif demand. Water from the Nira Right Bank Canal had, therefore, to be obtained to supplement the Mhaswad Tank supply in the Rabi season so as to meet the demands of the irrigators. The highest level reached during the year was at R.L. 1940·10 on the 24th September.

The rainfall in the Canal tract was 20·23 inches compared with 18·70 inches, the average of the preceding three years.

The following table shows the area irrigated, revenue assessed, etc., during the year as compared with the corresponding averages of the past three years :—

| Area irrigated. | | Gross assessed revenue. | | Working expenses. | |
|---|---|---|---|---|---|
| 1938-39. | Average. | 1938-39. | Average. | 1938-39. | Average. |
| Acres. | Acres. | Rs. | Rs. | Rs. | Rs. |
| 1,682 | 3,741 | 13,163 | 21,403 | 19,757 | 16,112 |

The area irrigated and gross revenue assessed during the year 1938-39 on Branch No. III of the Nira Right Bank Canal referred to above, were 5,310 acres and Rs. 26,523, respectively.

## KHANDESH DIVISION.

### Jamda Canals.

These canals receive their supply from the Girna river and the supply is supplemented from time to time by water obtained from the Chankapur Tank in the Nasik Irrigation Division. During the year under report no water could be obtained from the Chankapur Tank. The rainfall during the year was 32·39 inches, as compared with 27·83 inches, the average of the preceding three years. The subjoined table shows the area irrigated, the gross assessed revenue and the working expenses as compared with the corresponding average of the preceding three years :—

| Area irrigated. | | Gross assessed revenue. | | Working expenses. | |
|---|---|---|---|---|---|
| 1938-39. | Average. | 1938-39. | Average. | 1938-39. | Average. |
| Acres. | Acres. | Rs. | Rs. | Rs. | Rs. |
| 1,029 | 1,454 | 8,581 | 13,579 | 14,265 | 17,177 |

## Hartala Tank.

The tank derives its supply solely from local rains and this supply is precarious. On the 1st April, the storage of the tank amounted to 83·57 million cubic feet and this gradually diminished to 59·09 million cubic feet. The first replenishment which was received on the 4th June, raised the contents to 60·35 million cubic feet. The maximum storage of 144·20 million cubic feet was reached on the 21st June. On the 31st March 1939, the storage was 30·49 million cubic feet. The rainfall gauged at the tank was 47·72 inches as compared with 36·02 inches, the average of the preceding three years.

The subjoined table shows the area irrigated, the gross assessed revenue and the working expenses as compared with the corresponding averages of the preceding three years :—

| Area irrigated. | | Gross assessed revenue. | | Working expenses. | |
|---|---|---|---|---|---|
| 1938-39. | Average. | 1938-39. | Average. | 1938-39. | Average. |
| Acres. | Acres. | Rs. | Rs. | Rs. | Rs. |
| 24 | 14 | 122 | 325 | 689 | 936 |

## Mhaswa Tank.

The tank derives its supply from local rains. On the 1st April, the storage of the tank amounted to 4·86 million cubic feet. The tank gradually became dry and remained so until 31st May. The first replenishment was received on the 1st June, when the contents increased to 16·10 million cubic feet. The maximum storage of 193·29 million cubic feet was obtained on the 7th August ; on the 31st March, the storage was 20·85 million cubic feet. The rainfall gauged at the tank was 32·40 inches as compared with 18·69 inches, the average of the preceding three years.

The area irrigated, the gross assessed revenue and the working expenses, as compared with the corresponding averages of the preceding three years are given below :—

| Area irrigated. | | Gross assessed revenue. | | Working expenses. | |
|---|---|---|---|---|---|
| 1938-39. | Average. | 1938-39. | Average. | 1938-39. | Average. |
| Acres. | Acres. | Rs. | Rs. | Rs. | Rs. |
| 446 | 92 | 4,281 | 1,890 | 1,058 | 1,339 |

## SHAHADA CHANNEL.

The channel is fed by the Gomai river which has a perennial flow. The rainfall gauged at Shahada was 29·14 inches as compared with 22·14 inches, the average of the preceding three years. There was sufficient supply of water throughout the year and the demand for water was normal in both Kharif and Rabi seasons.

The area irrigated, the gross assessed revenue and the working expenses as compared with the corresponding averages of the preceding three years are given below :—

| Area irrigated. | | | | Gross assessed revenue. | | Working expenses. | |
|---|---|---|---|---|---|---|---|
| Patasthal. | | Jirayat. | | | | | |
| 1938–39. | Average. | 1938–39. | Average. | 1938–39. | Average. | 1938–39. | Average. |
| Acres. | Acres. | Acres. | Acres. | Rs. | Rs. | Rs. | Rs. |
| 969 | 1,006 | 911 | 866 | 10,461 | 11,885 | 5,950 | 6,053 |

## LOWER PANJHRA RIVER WORKS.

These works comprise 8 bandharas and 9 channels situated between Dhulia and Betawad on the Panjhra river, and the Mukti Tank, which is situated about 4 miles to the South-West of Dhulia. The channels obtain their supply from the river but when that supply is insufficient, it is supplemented by water obtained from the Mukti Tank.

On the 1st April, the contents of the tank were 183·04 million cubic feet, which gradually diminished to 131·60 million cubic feet. The first replenishment was received on the 27th May which raised the contents to 135·75 million cubic feet. The maximum storage of 351·10 million cubic feet was reached on the 6th August. The year closed with a storage of 243·63 million cubic feet. The rainfall gauged within the catchment at Dayana and Sadgaon during the year was 25·56 inches as compared with 19·45 inches, the average of the preceding three years.

The subjoined table shows the area irrigated, the gross assessed revenue and the working expenses as compared with the corresponding averages of the preceding three years :—

| Area irrigated. | | | | Gross assessed revenue. | | Working expenses. | |
|---|---|---|---|---|---|---|---|
| Patasthal. | | Jirayat. | | | | | |
| 1938–39. | Average. | 1938–39. | Average. | 1938–39. | Average. | 1938–39. | Average. |
| Acres. | Acres. | Acres. | Acres. | Rs. | Rs. | Rs. | Rs. |
| 1,279 | 1,270 | 1,115 | 1,076 | 27,127 | 25,291 | 4,817 | 3,911 |

### NASIK DIVISION.

#### PARSUL TANK.

This tank is formed by an earthen dam across the Parsul river in the Malegaon taluka of the Nasik District. It depends solely on local rains for its supply. The storage capacity of the tank is 119 million cubic feet with a depth of 35 feet. There is no canal and the irrigation is done by small channels taking off the Parsul river itself downstream of the tank.

On the 1st April, the level of water in the tank was 14·45 feet, the corresponding contents being 24·38 million cubic feet. The first replenishment was received on 23rd May. The level of water reached 35·05 feet on the 31st October and continued till 17th November, the corresponding contents being 118·70 million cubic feet. The level of water on the 31st March 1939 was 19·80 feet, the corresponding contents being 42·20 million cubic feet. The average rainfall in the catchment area of the tank was 18·07 inches compared with 13·73 inches, the average of the preceding three years.

The following table gives the figures of area irrigated, revenue assessed, etc. during the year as compared with the averages of the past three years :—

| Area irrigated. | | Gross assessed revenue. | | Working expenses. | |
|---|---|---|---|---|---|
| 1938-39 | Average. | 1938-39 | Average. | 1938-39 | Average. |
| Acres. | Acres. | Rs. | Rs. | Rs. | Rs. |
| 1,055 | 773 | 4,213 | 3,460 | 1,443 | 1,590 |

The cost of the measuring establishment employed was equivalent to 4 annas 7 pies per acre. An expenditure of Rs. 699 was incurred on maintenance and repairs during the year.

## SOUTHERN CIRCLE.

### BELGAUM DIVISION.

#### GADIKERI TANK.

The lands under the command of the tank are all assessed at consolidated rates. The area irrigated and the irrigation share of the land revenue assessed were 418 acres and Rs. 2,344, respectively.

#### GOKAK CANAL.

This canal system is the most important irrigation scheme in the Southern Circle and consists of a reservoir formed by a masonry weir across the Ghataprabha river at Dhupdal in the Belgaum District,

together with 16 miles of main and branch canals and 36 miles of distributaries. The canal commands an area of 18,668 acres, the area irrigable being 17,627 acres. Although the Dhupdal Storage is mainly intended for irrigating lands under the Canal, a stipulated quantity of water is issued to the Gokak Mills Company in accordance with an agreement between Government and the Company, in consideration of which a sum of Rs. 14,313 is annually paid by the Company subject to a rebate in the event of the supply falling short of the quantity contracted for. During the year under report no rebate had to be paid to the Company.

Water was supplied to the M. & S. M. Railway Company at their Hukeri Road Station at a rate of Rs. 5 per 10,000 cubic feet of water actually drawn and measured by a meter. The total amount recovered from the Railway Company on this account during the year was Rs. 445.

On the 1st April, the gauge reading of the water level in the Dhupdal Reservoir was 20·90 feet. The level gradually decreased to 14·80 feet on the 23rd May. Owing to replenishment received the water in the Reservoir rose to its F. S. L. i.e., 22·90 on 11th June 1938 causing overflow over the weir on the same day. There was a continuous overflow from that date to 29th July except for 2 days, i.e., on 6th and 7th July. During the whole monsoon the highest flood depth over the crest was 2·24 feet on the 20th July. The maximum discharge for the day was 31,762·88 cusecs. In order to store the water from the post-monsoon floods the raising of the 4 feet temporary crest excepting the top 2 feet of the 100 reserve bays was commenced on 18th September and completed on 23rd October 1938. The closure of 100 reserve bays was carried out on 26th and 27th October. The level rose to 26·06 feet (the full supply level) on the 1st November. This level continued until 19th December and then began to decrease. The level on 31st March 1939 was 20·92 feet.

The following table gives information regarding the area irrigated and revenue assessed as compared with the average of the previous three years :—

| — | Area irrigated. | Gross assessed revenue. |
|---|---|---|
| | Acres. | Rs. |
| Average .. .. .. .. .. | 8,893 | 68,604 |
| 1938-39 .. .. .. .. .. | 9,616 | 71,674 |

## BIJAPUR DIVISION.

### MUCHKUNDI TANK.

This tank is solely dependent on local rains for its supplies and the storage of water in the tank is uncertain owing to the scanty rainfall in the area and the smallness of the catchment. The rainfall recorded

during the year, was more than the average of the previous three years. Owing to favourable rains during the year there was decrease in the demand for tank water. The tank did not get dry during the year. The supply of water in the tank was sufficient for irrigating the lands dependent on it. The highest level of water during the year was R.L. 1799·14 or 15·7 feet above the sill of the outlet on the 8th October 1938 against the R. L. 1794·82 or 11·38 feet above the sill of the outlet on the 31st December 1937. The gross assessed revenue was Rs. 526 while the working expenses amounted to Rs. 1,410.

## DHARWAR DIVISION.

### DAMBAL TANK.

On the 1st April, the water level of the tank was at R. L. 139·64 or 3·44 feet above the silted bed of the tank. The tank received its first replenishment on the 22nd May. The highest water level reached during the year was R. L. 145·30 or 9·10 feet above the silted bed. The dam of the tank breached on the 23rd May due to heavy rains in the catchment area and from that time the tank was empty throughout the year and therefore there was no revenue on irrigation on non-consolidated area under it. The work of closing the breach was completed in March 1939. The rayats, however, derived some benefit from the cultivation of the lands in the tank bed leased to them. Part of the land dependent on this tank is assessed at water rates, the balance being assessed at consolidated rates. The total area irrigated and the assessment levied under water rates were 3 acres and Rs. 21 as compared with 298 acres and Rs. 1,185 the corresponding averages of the past three years. The irrigated area under consolidated assessment and the irrigation share of the land revenue assessed were 144 acres and Rs. 916, respectively. The total assessed revenue was Rs. 1,910.

In closing the breach, provision for the following was made :—

(*a*) a masonry core wall in the nala or gorge portion ;

(*b*) puddle of murum and black soil ;

(*c*) cross and longitudinal drainages to drain off the percolation water ;

(*d*) murum casing to a depth of 2 feet on the upstream slope and the top of the dam.

### MEDLERI TANK.

On the 1st April, the water level of the tank was at R. L. 167·05 or 2·05 feet above the sill of the outlet. It was thereafter dry up to the 21st May and received replenishment on the 22nd May. The highest level reached during the year was R. L. 175·40 or 10·40 feet above the sill of the outlet. The tank was again empty from 19th to 31st March. The area irrigated and the assessment levied thereon were 39 acres and Rs. 424 as compared with 49 acres and Rs. 558, respectively, the averages of the past three years. The gross assessed revenue was Rs. 565.

## MADAG TANK.

On the 1st April, the water level was at R. L. 1875·33 or 2·7 feet above the sill of the outlet. The tank received its first replenishment on the 3rd July and overflowed from 5th July to 18th December. The highest water level reached during the year was R. L. 1882·56 or 4·85 feet above the crest of the waste weir. The water level on the 31st March was R. L. 1875·20 or 1·94 feet above the sill of the outlet. Water supply was sufficient for hot weather requirement. The area irrigated and the assessment levied thereon were 390 acres and Rs. 1,723, respectively, as compared with 542 acres and Rs. 2,498, respectively, the corresponding averages of the past three years. The decreases both in the area irrigated and the assessment were due to less demand for tank water. The gross assessed revenue amounted to Rs. 1,918 as compared with Rs. 3,592, the the average of the previous three years.

Murum casing of 6" over the Left Bank Canal service road at Masur was provided and a wing wall for supporting Bank behind a high staunch wall on down stream side of the Left Bank Canal. Aqueduct No. 3 in mile No. 5/1 was constructed during the year.

## ASUNDI TANK.

On the 1st April, the water level was at R. L. 101·96 or 2·96 feet above the sill of the outlet. The tank was dry from 15th April to end of the year. The lands under this tank are partly assessed at water rates and partly at consolidated rates. The area irrigated and assessment levied thereon under the former head (water rates) were 32 acres and Rs. 164 as compared with 64 acres and Rs. 323, respectively, the corresponding averages of the past three years. The area under consolidated assessment was 182 acres and the irrigation share of land revenue assessed thereon was Rs. 710. The gross assessed revenue amounted to Rs. 1,681 as compared with Rs. 1,317, the average of the past three years.

## DHARMA CANAL.

This canal is fed by the Dharma River and a number of tanks are in turn fed by the canal. The canal began to flow on 14th June. The rainfall at the beginning of the season was fair and kept the canal flowing. This helped to fill the tanks from the tail and to give first watering to almost all lands except some in tail villages when water in the canal began to go down and could not reach the tail lands. There was continuous break in the monsoons during August and September and the existing supply proved quite inadequate for the second watering. There was considerable trouble in distributing the water. The rains in the last week of November 1938 however brought good replenishment and it was possible to irrigate a fairly large area and save the crops from complete failure. The condition of the crop was normal.

The canal is an old one and is dependent on the rains for its supply. There is no storage reservoir. To overcome these difficulties it is

proposed to construct a storage reservoir at Yemagalli and also to clear the entire canal system. Outlet No. 34 (Badagimadi) in mile No. 12 was reconstructed (after the Jamrao Canal open type outlet design), during the year.

The lands commanded by this canal are assessed partly at water rates and partly at consolidated rates. The area irrigated and the assessment levied thereon under the former head (water rates) were 431 acres and Rs. 2,720, respectively, as compared with 492 acres and Rs. 2,681, respectively, the corresponding averages of the previous three years. The gross assessed revenue (after deducting Rs. 23,156 to be credited to old work) amounted to Rs. 1,590.

## KANARA DIVISION.

### MAVINKOP TANK.

The management of this tank has been entrusted to the Revenue Department. The rainfall was 42·84 inches. The supply of water in the tank was adequate for irrigation. The area irrigated which is assessed at consolidated rates amounted to 483 acres and the irrigation share of land revenue was Rs. 2,018 as compared with 490 acres and Rs. 2,018 for the previous year. The gross assessed revenue was Rs. 2,018.

# SECTION II.

## COMPRISING IRRIGATION WORKS FOR WHICH NEITHER CAPITAL NOR REVENUE ACCOUNTS ARE KEPT.

### DETAILED REPORTS BY LOCAL OFFICERS.

## NORTHERN CIRCLE.

### AHMEDABAD, KAIRA AND PANCH MAHALS AND SURAT AND BROACH DIVISIONS.

### KHARI SLUICES.

The flow in the Khari river was not satisfactory owing to poor rainfall. The area of transplantation of rice was 5,706 acres. As the flow in the Khari failed in the latter part of the season some of the area dried up and remissions had to be granted by the Revenue Department. Besides this, a non-himayat paying area of about 140 acres was also irrigated under this system.

The Khari sluices including the Goblaj tank, the Bherai and the Naika reservoirs were maintained in good order at a cost of Rs. 4,724. The sums of Rs. 800 and Rs. 97 were also spent on special repairs to the Goblaj tank and the Bherai reservoir. The work of additions and alterations to the 2′ diameter inlet barrel in the Khari bank near Naika Reservoir was completed at a cost of Rs. 1,850. The miscellaneous revenue under the Khari Sluices System amounted to Rs. 600 compared with Rs. 207 received in the previous year.

The following table compares the areas irrigated and the assessment levied during the year with the respective averages of the previous three years :—

| — | Average. | | 1938-39. | |
|---|---|---|---|---|
| | Area. | Revenue after deducting remissions. | Area. | Revenue after deducting remissions. |
| | Acres. | Rs. | Acres. | Rs. |
| I. Irrigation above Kalambandhi villages (of Mahij, Bidaj and Lali) .. .. | 1,237 | 3,605 | 376 | .... |
| II. Irrigation from tanks that can be fed by the river Khari— | | | | |
| Goblaj .. .. | 396 | 2,689 | 115 | 985(a) 1,737(b) |
| Galki .. .. | 261 | 731 | .... | |
| III. Irrigation from Khari sluices proper (i.e., 11 Kalambandhi villages) .. .. | 6,041 | 13,346 | 5,706 | 21,625 |
| Total .. | 7,935 | 20,371 | 6,197 | 24,347 |

(a) Includes arrears of past years.

(b) Past year's arrears realised during the year.

The assessment in respect of irrigation dependent on the Khari sluices in the Kalambandhi villages is consolidated. The average rates per acre for land and water respectively were as under :—

| —— | Irrigation share. | Land share. | Total consolidated. |
|---|---|---|---|
| | Rs. a. p. | Rs. a. p. | Rs. a. p. |
| Government land .. .. .. | 0 5 4 | 4 0 6 | 4 5 10 |
| Alienated land .. .. .. .. | 0 5 4 | 1 1 5 | 1 6 9 |

## MUVALIA TANK.

This is an important tank situated in the vicinity of Dohad town in the Broach and Panch Mahals Collectorate and has a catchment area of about 30 square miles. During the year under review, it received a favourable replenishment. There was great demand for water during the Kharif and Rabi Seasons. There was good irrigation in both the seasons under this tank. The area irrigated was 1,298 acres and the net assessment amounted to Rs. 3,821. The miscellaneous revenue amounted to Rs. 223 compared with Rs. 81 received in the previous year. The amounts of Rs. 2,843, Rs. 685 and Rs. 407 were spent (1) for providing reinforced Cement brick lining to Right Bank Canal, (2) for lowering the sill of the masonry outlet, and (3) for lowering Left Bank Canal.

## OLD TANKS.

Improvements to 1 tank in the Ahmedabad Division and 2 tanks in the Kaira and Panch Mahals Division and repairs to 21 tanks in the Ahmedabad Division, 24 tanks in the Kaira and Panch Mahals Division and 50 tanks in the Surat and Broach Division were carried out at a total cost of Rs. 4,555 and Rs. 44,932, respectively. The areas irrigated and the revenue derived from the old irrigation tanks and bunds were as under :—

| Name of Collectorate. | Area irrigated. | Revenue. | | Total consolidated assessment. |
|---|---|---|---|---|
| | | Irrigation share. | Land share. | |
| | Acres. | Rs. | Rs. | Rs. |
| Ahmedabad .. .. | 13,780 | 12,800 | 46,121 | 58,921 |
| Kaira .. .. | 542 | 2,360 | 76 | 2,436 |
| Panch Mahals .. .. | 270 | 689 | 1,436 | 2,125 |
| Broach .. .. | 697 | 1,481 | 5,015 | 6,496 |
| Surat .. .. | 3,796 | 6,701 | 33,106 | 39,807 |

### Drainage Channels.

The drainage channels in the Ahmedabad, Kaira and Panch Mahals and Surat and Broach Divisions, were maintained in good order at a cost of Rs. 7,659, Rs. 6,986 and Rs. 4,244, respectively.

## DECCAN IRRIGATION CIRCLE.

### NIRA CANALS DIVISION.

### Rakh Tank.

This tank is situated about 5 miles from Walha railway station of the Madras and Southern Mahratta Railway and is formed by an earthen dam constructed across a nala near Rakh village in Purandhar Taluka of the Poona District. The catchment area of the tank is 5·38 square miles and its capacity is only 34·2 million cubic feet. The tank has two channels of a total length of 3⅝ miles. The area under command on channel No. 1, which is on the left bank, is 265 acres and that on channel No. 2 is 321 acres. The main channel is designed to discharge 12·8 cusecs leaving sufficient margin for all losses in transit. An area of 226 acres was irrigated and the revenue assessed amounted to Rs. 1,112 as compared with 200 acres and Rs. 944, respectively during the previous year.

### Khamgaon Tank.

This tank which is situated in mile 23 of the Mutha Right Bank Canal is only partially completed, receives replenishment during the monsoon from the Mutha Right Bank Canal Distributary No. 17. The supply available was issued for the irrigation of 255 acres and the irrigation revenue assessed was Rs. 1,278, the corresponding figures for the previous year being 298 acres and Rs. 1,448, respectively.

### Effluent Irrigation on the Mutha Right Bank Canal.

The total area of sugarcane irrigated on effluent during the year was 665 acres as compared with 315 acres during the previous year. The average discharge pumped during the year was 10·43 cusecs out of which 9·46 cusecs were utilised for purposes of irrigation and the balance of ·97 cusec was run off to the winter disposal area. The total area irrigated was 1,224 acres as compared with 780 acres during the previous year. The assessed revenue amounted to Rs. 58,810 as compared with Rs. 25,517 during the previous year. The rate for the supply of effluent for sugarcane was Rs. 72 per acre during the year under report. The increase in the assessed revenue was partly due to increase in rate and also increase in the area irrigated. Remissions amounting to Rs. 36 were sanctioned during the year under report.

## BANDHARAS (POONA DISTRICT).

Bandharas are small weirs built across streams in order that the level of the water flowing in the streams may be raised sufficiently to command the lands to be irrigated. The following table gives the area irrigated and the consolidated assessed revenue on the bandharas in the Poona Collectorate during the year as compared with the average of the past three years :—

| — | Area irrigated. | Consolidated revenue. | | |
|---|---|---|---|---|
| | | Irrigation share. | Land share. | Total. |
| | Acres. | Rs. | Rs. | Rs. |
| 1938-39 .. .. | 2,520 | 13,300 | 4,897 | 18,197 |
| Average .. .. | 2,796 | 14,198 | 4,939 | 19,137 |

## BANDHARAS (NASIK DISTRICT).

There are numerous bandharas situated in this District. There are in all 299 such bandharas on the list. The expenditure incurred on repairs to bandharas (57 in number) during the year amounted to Rs. 43,190. The following table gives the area irrigated and the consolidated assessed revenue during the year as compared with the averages of the past three years :—

| — | Area irrigated. | Consolidated revenue. | | |
|---|---|---|---|---|
| | | Irrigation share. | Land share. | Total. |
| | Acres. | Rs. | Rs. | Rs. |
| 1938-39 .. .. | 26,771 | 1,90,259 | 53,118 | 2,43,377 |
| Average .. .. | 27,152 | 1,83,320 | 55,317 | 2,38,637 |

## AHMEDNAGAR DIVISION.

### VISAPUR TANK.

The Visapur Tank dam which is situated about 2 miles from the Visapur railway station on Dhond-Manmad Railway line is built across the Hanga river, a tributary of the Bhima river. It was started as a famine relief work in 1896 and was subsequently completed in successive stages by criminal tribes and convict labour by June 1927. This earthen dam

which is 7,440 feet long and 84 feet high, forms a lake having a net capacity of 1,136 million cubic feet. The estimated cost of the whole scheme was Rs. 41 lakhs of which a sum of Rs. 21 lakhs was spent on the dam and head works and the balance on the construction of the canal, distributaries and minors, which aggregate 46 miles in length. The total area under command is 95,000 acres of which 26,000 acres are irrigable. The catchment area of the tank is 159 square miles in extent and it has a capacity of 1,172 million cubic feet. Irrigation from this tank was first started during the rabi season of 1929-30. Owing to an increased demand for water due to the starting of a small sugar factory on the Chimbla Distributary, the waste weir was raised by 2 feet in March 1934 to increase the storage in the tank by 130·20 million cubic feet. The yield from the catchment (159 square miles) was 1,934 million cubic feet during the year, the average rainfall being 17·30 inches.

On the 1st April, the level of water in the tank was 36 feet above the sill of the outlet, the contents being 926·04 million cubic feet. The lowest level of 33·25 feet was reached on the 26th May 1938, the corresponding contents then being 804·12 million cubic feet. Replenishment was received in the tank on the 27th May. The highest level of 42·35 feet was reached on the 4th August 1938 with a storage equivalent to 1,321·48 million cubic feet. On the 31st March 1939, the level of water in the tank was 34·85 feet, the corresponding contents being 868 million cubic feet. The tank overflowed for a period of 5 days from 4th to 8th August 1938. The area irrigated, the irrigation assessment and the gross assessed revenue were 2,732 acres, Rs. 23,547 and Rs. 25,377 as compared with 1,846 acres, Rs. 13,531 and Rs. 19,415 respectively, the averages of the past three years. The expenditure incurred on maintenance and repairs to the tank and canal amounted to Rs. 7,443.

## Mandavgan Tank.

This tank is situated on a nala about 2½ miles away from Mandavgan village, taluka Shirgonda in the Ahmednagar District. The earthen dam is 1,605 feet in length. The tank has a hilly catchment of about 5·32 square miles. It is entirely dependent on local rains for its supply of water. This tank has been taken over from the District Local Board, Ahmednagar, from the rabi season of 1932–33, for irrigation management. Replenishment was received on the 31st May, the corresponding contents being 10·06 million cubic feet. The area irrigated and the water rates assessed during the year were 67 acres and Rs. 314, respectively, as compared with 91 acres and Rs. 411, respectively, during the previous year. The expenditure incurred on maintenance and repairs amounted to Rs. 970.

# CENTRAL CIRCLE.

The area irrigated and the gross assessed revenue on small tanks were 1,442 acres and Rs. 7,464, respectively. The area irrigated and the irrigation share of revenue on the old bandharas and channels in the Khandesh Division were 8,444 acres and Rs. 63,026, respectively.

## SHOLAPUR DIVISION.

### WADSHIVNE TANK.

On the 1st April, the level of the water in the tank was 12·02′ above the sill of the outlet and this level gradually rose to R. L. 452·65 which was the highest level reached on the 8th October.

During the year under report, the area irrigated and the gross assessed revenue were 837 acres and Rs. 4,136 as compared with 589 acres and Rs. 2,934, the corresponding averages of the previous three years.

The rainfall gauged at the Tank was 28·00 inches, as compared with 21·68 inches, the average of the preceding three years.

## KHANDESH DIVISION.

### TALWADA TANK.

The supply in this tank is generally uncertain. On the 1st April, the tank was dry. The first replenishment was received on the 2nd June, when the contents were 12·43 million cubic feet. The maximum storage of 26·32 million cubic feet was reached on the 1st February.

The rainfall gauged at the tank was 28·31 inches as compared with 15·92 inches, the average of the preceding three years. The area irrigated was 395 acres and the gross assessed revenue amounted to Rs. 2,139. The revenue realised from water rates during the year was Rs. 2,036 the miscellaneous realisations being Rs. 53. The expenditure incurred on the maintenance and repairs to the tank and canal was Rs. 396.

### OLD WORKS.

The old bandharas and channels are grouped as under :—

1. The Upper Panjhra river group including Gondur Tank.
2. The Kan river group.
3. The Burai river group.
4. The Girna river group.
5. The Bori river group.

The subjoined table shows the area irrigated and the revenue derived from these works as compared with the averages of the preceding three years :—

| Area irrigated. | | Revenue. | | | | | |
|---|---|---|---|---|---|---|---|
| | | Irrigation share. | | Land share. | | Total. | |
| 1938–39 | Average. | 1938–39 | Average. | 1938–39 | Average. | 1938–39 | Average. |
| Acres. | Acres. | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. |
| 8,444 | 8,662 | 63,026 | 65,131 | 12,644 | 13,188 | 75,670 | 78,318 |

The expenditure on these bandharas was as under :—

| | Rs. |
|---|---|
| Extensions and improvements .. .. | 977 |
| Repairs .. .. .. .. | 1,869 |

An expenditure of Rs. 248 was also incurred on river and rain gauge operations during the year.

### NASIK DIVISION.

### Khirdi Sathe Tank.

This is a small tank in Yeola Taluka of the Nasik District. The tank is formed by an earthen dam and is dependent on local rains for its supply which is generally sufficient for crops grown during the monsoon and rabi seasons.

On the 1st April, the level of water in the tank was at R. L. 217·00, the contents being 2·36 million cubic feet. Replenishment commenced on the 31st May and the water level rose to 14·5 feet above the sill on the 1st of November, the contents being 45·5 million cubic feet. The draw off for irrigation purposes commenced on the 18th November when the level of water was 14·5 feet and the contents 45·5 million cubic feet. On the 31st March the level of water was 7·10 feet above the sill, the contents being 13·00 million cubic feet. The area irrigated during the year was 210 acres as compared with 166 acres, the average of the previous three years. The increase was due to the heavy rainfall at the end of the monsoon. The assessed revenue on account of water rates amounted to Rs. 1,023 as compared with Rs. 1,507 the average of the previous three years, the miscellaneous receipts being Rs. 166.

## SOUTHERN CIRCLE.

### BELGAUM DIVISION.

There are approximately 525 second class irrigation tanks situated in the Belgaum Division. During the year under report repairs to 36 tanks were carried out at a cost of Rs. 14,400 and in addition to this sum,

an expenditure of Rs. 2,462 was incurred on the survey of the old tanks. The area irrigated during the year was 13,153 acres, the irrigation share of land revenue being Rs. 1,03,276. The total direct and indirect receipts amounted to Rs. 1,03,320 as compared with Rs. 1,00,034 during the previous year. The remissions sanctioned during the year amounted to Rs. 18,480.

### BIJAPUR DIVISION.

There are 14 tanks in this Division, out of which 4 have been declared as second class Irrigation tanks. During the year under report an expenditure of Rs. 664 was incurred on repairs to 2 tanks. The area irrigated during the year was 1,059 acres and the irrigation share of land revenue amounted to Rs. 3,824. No remissions were granted during the year. The total direct and indirect receipts during the year under report were Rs. 6,532 against Rs. 5,557 for the previous year.

The work of constructing an Irrigation tank at Nandargi, taluka Indi (Minor Irrigation Works) was first started as a scarcity work in the year 1938 to provide work to the scarcity stricken people in the area. An expenditure of Rs. 5,557 was incurred during the year under report against the estimated amount of Rs. 99,106. On the cessation of scarcity conditions, the work has been let out on contract in January 1939. The work is in progress.

### DHARWAR DIVISION.

There are about 2,931 second class Irrigation tanks. During the year under report an expenditure of Rs. 30,849 was incurred on repairs to about 78 tanks and a sum of Rs. 3,663 was spent on extensions and improvements, etc. The area irrigated during the year was 47,065 acres and the irrigation share of land revenue amounted to Rs. 1,26,482. The remissions granted during the year amounted to Rs. 59,633. The total direct and indirect receipts were Rs. 1,28,179 as compared with Rs. 1,28,475 for the previous year.

### KANARA DIVISION.

In this Division there are about 184 second class Irrigation tanks. During the year, an expenditure of Rs. 9,929 was incurred on repairs to 40 tanks. In addition, a sum of Rs. 2,936 was spent on "surveying irrigation tanks and preparing projects for their improvements". The area irrigated during the year was 30,910 acres and the irrigation share of land revenue was Rs. 90,200 of which Rs. 81,619 were realised during the year.

### RATNAGIRI DIVISION.

There are only four tanks in this Division. The area irrigated was 1,374 acres and the irrigation share of land revenue was Rs. 6,266, the whole of which was realised during the year.

# SECTION III.

# RESEARCH WORK.

## POONA IRRIGATION AND RESEARCH DIVISION.

In the Deccan, when a large perennial canal is opened, widespread water-logging is liable to ensue. Some of this water-logging dries out later, but the damage often extends rapidly into the valleys, and unless steps are taken to set matters right, the damage, consisting mainly of salt-efflorescence, becomes permanent. The seriousness of the menace was realised as early as 1888 and the controversy regarding the relative effect of channel losses and wasteful irrigation and the best methods to adopt to safeguard the land became yearly more acute. Various experiments were carried out at the instance of the Agricultural Department but by 1913 it was clear that all the methods tried so far had failed. It was eventually decided to open a Special Irrigation Division in order that the question of canal development, especially as regards safeguarding the soil, might form the subject of investigation. In June 1916, the Division (now called the Poona Irrigation and Research Division) was formed and the work entrusted to it was the contouring of the commanded areas, the carrying out of a careful survey and classification of the surface and sub-soil, the selection and marking out of definite areas suitable for "blocks" for perennial and other crops, the designing of the drainage works required, the indication of suitable lines of communication and centres for the establishment of crushing, grinding, and refining and other machinery for trade purposes and the study of the question of the reclamation of waste lands and areas damaged by water-logging and salt-efflorescence and the growth of useful timber in such tracts and along the main canal. In short, research and investigation into all the problems relating to irrigation by means of actual experiment has been the sphere of work of this Division.

The investigations coming within this sphere may be broadly grouped under four heads, viz.:—

(1) Irrigation management,

(2) Irrigation requirements or the inter-action of agricultural requirements and irrigation limitations,

(3) Soil physics of irrigated tracts,

(4) Drainage and reclamation.

The work done by this Division may be classified as under :—

(1) Sub-soil survey and observation of sub-soil water levels,

(2) Irrigation and blocks,

(3) Sub-soil drainage construction,

(4) Drainage schemes for allotted sugar factory areas,

(5) Irricultural research.

A brief account of the work done during the year under each of these heads is given below :—

### (1) Sub-soil Survey and Observations of Sub-soil Water Levels.

The observations of damage and well water levels on the Godavari, the Pravara and the Nira Canals were continued. The damage has increased due to the concentration of sugarcane by the Sugar Companies and in order therefore to protect lands from damage construction work of drainages in some of the factory areas has been commenced. Safe limits of sugarcane areas to be allowed on each distributary of the Godavari Canals and for some area on the Nira Left Bank Canal were investigated and fixed.

### (2) Irrigation and Blocks.

Individual inspection of lands as regards the drainage and the suitability of the soil for fruit-gardens for which applications were received were carried out during the year. Applications for exemption from the rule disallowing perennial irrigation within one-fourth mile limit of towns and villages were investigated.

### (3) Sub-soil Drainage Construction.

Detailed observations were made in the areas served by the drainage schemes already constructed. The improvement in the condition of the damaged areas continues. The construction work of the following drainage works was in progress during the year :—

(1) Manjri Drainage Scheme (Mutha Right Bank Canal).

(2) Deolali Drainage Scheme (Pravara Right Bank Canal).

(3) Douch Drainage Scheme (Godavari Canals).

(4) Nandur-Khandala Drainage Scheme (Pravara Left Bank Canal).

### (4) Drainage Schemes for allotted Factory Areas.

Considerable progress was made in the projects for land drainage in the allotted sugar factory areas and plans and estimates for several projects of drainage schemes in respect of the various Sugar Factories on the Deccan Canals were prepared and the construction work of drainages was in progress in the Belapur Company, the Saswad Mali Sugar Factory and Phaltan Sugar Works area. A careful watch is being kept on the factory areas in many catchments in which full sugarcane concentration has been reached.

### (5) Irricultural Research.

In the Hadapsar Effluent Experimental Area, field experiments were carried out with a view to finding out the best varieties of sugarcane

and the most suitable treatment and methods of cultivation of sugarcane manured by effluent. The question of the disposal of the increasing quantity of effluent by more concentrated and prolonged application and the effect on the soil of effluent manuring year after year was also under investigation.

In the Baramati Experimental Salt Area, field experiments on soil reclamation after drainage based on the data from laboratory and plot scale experiments were carried out. Method of cultivation, fertilizers, green manures and sugarcane varieties suited to the process of reclamation were tested with satisfactory results. This research has wide application on the damaged areas on the Deccan Canals.

## STATEMENT I-E.

STATEMENT

## *Statement of Area irrigated by Irrigation Works in the*

| No. | Name of work. | Area irrigated. | | | | | Double cropped. | |
|---|---|---|---|---|---|---|---|---|
| | | Kharif. | Rabi. | Total. | Flow. | Lift. | Area irrigated. | Percentage of total area. |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | Acres. | Acres. | Acres. | Acres. | Acres. | Acres. | |
| | WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT. | | | | | | | |
| | PRODUCTIVE. | | | | | | | |
| | *Southern Circle.* | | | | | | | |
| 1 | Gadikeri Tank .. .. .. | *418 | .. | *418 | *418 | .. | .. | .. |
| 2 | Mavinkop Tank .. .. .. | *483 | .. | *483 | *483 | .. | .. | .. |
| | *Central Circle.* | | | | | | | |
| 3 | Ekruk Tank .. .. .. | (863)<br>1,539 | (2,328)<br>2,757 | (3,191)<br>4,296 | 4,244 | 52 | .. | .. |
| 4 | Shahada Channel .. .. | (511)<br>527<br>*541 | (379)<br>384<br>*428 | (890)<br>911<br>*969 | 911<br>*969 | .. | 10 | ·53 |
| | Total, Productive .. | 2,066<br>*1,442 | 3,141<br>*428 | 5,207<br>*1,870 | 5,155<br>*1,870 | 52 | 10 | .. |
| | UNPRODUCTIVE. | | | | | | | |
| | *Northern Circle.* | | | | | | | |
| 5 | Hathmati and Khari Cut Canal .. | 1,270<br>3,938 | 313<br>.. | 1,583<br>3,938 | 1,503<br>3,671 | 80<br>267 | ..<br>.. | ..<br>.. |
| 6 | Wangroli Tank .. .. .. | 1,447 | 14 | 1,461 | 1,422 | 39 | .. | .. |
| 7 | Savli Tank .. .. .. | 488 | .. | 488 | 482 | 6 | .. | .. |
| 8 | Sahiat Tank .. .. .. | 610 | .. | 610 | 608 | 2 | .. | .. |
| 9 | Tranza-Nagrama Tanks .. .. | .. | 11 | 11 | 11 | .. | .. | .. |
| 10 | Futelao Tank .. .. .. | .. | 119 | 119 | 119 | .. | .. | .. |
| | *Deccan Irrigation Circle.* | | | | | | | |
| 11 | Nira Left Bank Canal .. .. | (36,425)<br>36,860 | (47,901)<br>31,441 | 68,301 | 68,008 | 293 | 453 | ·66 |
| | Shetphal Tank .. .. .. | (3,306)<br>3,458 | (3,755)<br>1,936 | 5,394 | 5,394 | .. | .. | .. |
| 12 | Nira Right Bank Canal .. .. | (22,753)<br>20,955 | (25,414)<br>16,736 | 37,691 | 37,666 | 25 | 4 | .. |

I-E.

*Province of Bombay, during the year 1938-39.*

| Average discharges, cubic feet per second. | | | | Area irrigated per cubic foot per second. | | | | Base to which the duties of water are calculated. | |
|---|---|---|---|---|---|---|---|---|---|
| At Head. | | Utilized. | | Discharged at Head. | | Utilized. | | Kharif. | Rabi. |
| Kharif. | Rabi. | Kharif. | Rabi. | Kharif. | Rabi. | Kharif. | Rabi. | | |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| | | | | Acres. | Acres. | Acres. | Acres. | | |
| .. | .. | .. | .. | .. | .. | .. | .. | 15th February to 14th October. | 15th October to 14th February. |
| .. | .. | .. | .. | .. | .. | .. | .. | | |
| 7·33 | 25·09 | 7·33 | 25·09 | 145 | 109 | 145 | 109 | Do. .. | Do. |
| 8·57 | 17·77 | 8·57 | 17·77 | 123·92 | 51·94 | 123·92 | 51·94 | Do. .. | Do. |
| .. | .. | .. | .. | .. | .. | .. | .. | | |
| †120 | 22 | †73 | 22 | 10·07 | 14·23 | 16·56 | 14·23 | 15th June to 15th November. | 16th November to 14th February. |
| 40 | .. | 40 | .. | 82·02 | .. | 82·02 | .. | | |
| 100·60 | 0·34 | 100·60 | 0·34 | 14·38 | 41·17 | 14·38 | 41·17 | Do. .. | Do. |
| 41·81 | .. | 41·81 | .. | 11·67 | .. | 11·67 | .. | Do. .. | Do. |
| 36·63 | .. | 36·63 | .. | 16·65 | .. | 16·65 | .. | Do. .. | Do. |
| .. | .. | .. | .. | .. | .. | .. | .. | Do. .. | Do. |
| .. | 7·7 | .. | 7·7 | .. | 15·45 | .. | 15·45 | Do. .. | Do. |
| 373 | 484 | (h) 266 | (h) 399 | 98 | 99 | (h) 137 | (h) 120 | 15th February to 14th October. | 15th October to 14th February. |
| 21 | 33 | 21 | 33 | 157 | 113 | 157 | 113 | Do. .. | Do. |
| 315 | 404 | 257 | 284 | (a) 72 | (a) 63 | (a) 88 | (a) 89 | Do. .. | Do. |

STATEMENT

| No. | Name of work. | Area irrigated. | | | | | Double cropped. | |
|---|---|---|---|---|---|---|---|---|
| | | Kharif. | Rabi. | Total. | Flow. | Lift. | Area irrigated | Percentage of total area. |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | Acres. | Acres. | Acres. | Acres. | Acres. | Acres. | |
| | WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT —*contd.* | | | | | | | |
| | UNPRODUCTIVE—*contd.* | | | | | | | |
| | *Deccan Irrigation Circle*—contd. | | | | | | | |
| 13 | Mutha Canals .. .. | (7,429)<br>7,612 | (1,593)<br>1,726 | 9,338 | 9,211 | 127 | .. | .. |
| | Matoba Tank (e) .. .. | (621)<br>666 | (1,677)<br>1,787 | 2,453 | 2,453 | .. | .. | .. |
| 14 | Karsudi Tank (e) .. .. | ..<br>.. | (61)<br>64 | 64 | 64 | .. | .. | .. |
| 15 | Shirsuphal Tank (e) .. | (276)<br>288 | (746)<br>780 | 1,068 | 1,068 | .. | .. | .. |
| 16 | Bhadalwadi Tank (e) .. .. | (169)<br>210 | (999)<br>1,093 | 1,249 | 1,249 | .. | .. | .. |
| 17 | Lake Beale—Darna Dam .. .. | (305)<br>305 | (143)<br>143 | 448 | .. | 448 | .. | .. |
| | Godavari Right Bank Canal .. | (10,119)<br>14,466 | (11,031)<br>3,433 | 17,899 | 17,673 | 226 | 907 | 5·07 |
| | Godavari Left Bank Canal .. .. | (5,590)<br>8,726 | (10,060)<br>2,227 | 10,953 | 9,301 | 1,652 | 755 | 6·89 |
| 18 | Chankapur Tank—Girna Canal .. | (5,382)<br>5,436 | (4,087)<br>3,483 | 8,919 | 8,919 | .. | .. | .. |
| 19 | Kadwa River Works — Palkhed Canal .. | (1,101)<br>1,257 | (917)<br>814 | 2,071 | 2,051 | 20 | .. | .. |
| | Kadwa River Works — Ojhar Tambat Canal | (505)<br>575 | (493)<br>416 | 991 | 991 | .. | .. | .. |
| | Kadwa River Works — Wadali Canal .. | (269)<br>378 | (393)<br>254 | 632 | 632 | .. | .. | .. |
| 20 | Pravara Right Bank Canal .. | (5,270)<br>6,922 | (4,426)<br>856 | 7,778 | 7,778 | .. | 337 | 4 |
| | Pravara Left Bank Canal .. | (19,718)<br>24,316 | (20,790)<br>7,676 | 31,992 | 31,779 | 213 | 668 | 2·09 |
| 21 | Bhatodi Tank (e) .. .. | (83)<br>85 | (468)<br>578 | 663 | 663 | .. | .. | .. |

I-E—*contd.*

| Average discharges, cubic feet per second. | | | | Area irrigated per cubic foot per second. | | | | Base to which the duties of water are calculated. | |
|---|---|---|---|---|---|---|---|---|---|
| At Head. | | Utilized. | | Discharged at Head. | | Utilized. | | Kharif. | Rabi. |
| Kharif. | Rabi. | Kharif. | Rabi. | Kharif. | Rabi. | Kharif. | Rabi. | | |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| | | | | Acres. | Acres. | Acres. | Acres. | | |
| 161 | 106 | (c) | (h) 83 | (d) 49 | (d) 15 | (c) | 19 | 15th February to 14th October. | 15th October to 14th February |
| 12·65 | 17·35 | 12·65 | 17·35 | 48 | 99 | 48 | 99 | Do. .. | Do. |
| .. | .. | .. | .. | .. | .. | .. | .. | Do. .. | Do. |
| 5·6 | 9·3 | 5·6 | 9·3 | 49 | 80 | 49 | 80 | Do. .. | Do. |
| 2·2 | 7·1 | 2·2 | 7·1 | 77 | 141 | 77 | 141 | Do. .. | Do. |
| .. | .. | .. | .. | .. | .. | .. | .. | Do. .. | Do. |
| 228 | 270 | 228 | 270 | 44 | 40 | 44 | 40 | Do. .. | Do. |
| 114 | 144 | 114 | 144 | 49 | 70 | 49 | 70 | Do. .. | Do. |
| 67 | 94 | 67 | 94 | 80 | 45 | 80 | 45 | Do. .. | Do. |
| 18 | 24 | 18 | 24 | 61 | 38 | 61 | 38 | Do. .. | Do. |
| 5 | 8 | 5 | 8 | 101 | 62 | 101 | 62 | Do .. | Do. |
| 5 | 9 | 5 | 9 | 54 | 44 | 54 | 44 | Do. .. | Do. |
| 64·53 | 69·80 | 52·67 | 66·67 | (b) 82 | (b) 63 | (b) 100 | (b) 66 | Do. .. | Do. |
| 318·04 | 364·68 | 276·39 | 355·93 | (b) 62 | (b) 57 | (b) 71 | (b) 58 | Do. .. | Do. |
| 3·13 | 3·88 | 3·0 | 3·83 | (f) 28 | (f) 120 | (f) 27 | (f) 122 | Do. .. | Do. |

## STATEMENT

| No. | Name of work. | Area irrigated. | | | | | Double cropped. | |
|---|---|---|---|---|---|---|---|---|
| | | Kharif. | Rabi. | Total. | 1 Flow. | Lift. | Area irrigated. | Percentage of total area. |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT —*contd.* | Acres. | Acres. | Acres. | Acres. | Acres. | Acres. | |
| | UNPRODUCTIVE—*contd.* | | | | | | | |
| | *Central Circle.* | | | | | | | |
| 22 | Mhaswad Tank and Branch No. III of the Nira Right Bank Canal. | (989)<br>1,083<br>(2 415)<br>2,660 | (544)<br>599<br>(2,494)<br>2,650 | (1,533)<br>1,682<br>(4,909)<br>5,310 | 1,673<br>5,305 | 9<br>5 | .. | .. |
| 23 | Parsul Tank (e) .. .. .. | (460)<br>531 | (512)<br>524 | (972)<br>1,055 | 1,056 | .. | .. | .. |
| 24 | Koregaon Tank .. .. .. | ..<br>.. | (462)<br>504 | (462)<br>504 | 482 | 22 | .. | .. |
| 25 | Ashti Tank .. .. .. | ..<br>.. | (2,630)<br>2,865 | (2,630)<br>2,865 | 2,857 | 8 | .. | .. |
| 26 | Pathri Tank .. .. .. | (11)<br>16 | (600)<br>641 | (611)<br>657 | 616 | 41 | .. | .. |
| 27 | Jamda Canals .. .. .. | (285)<br>383 | (598)<br>646 | (883)<br>1,029 | 1,027 | 2 | .. | .. |
| 28 | Hartala Tank .. .. .. | (5)<br>6 | (16)<br>18 | (21)<br>24 | 24 | .. | .. | .. |
| 29 | Mhaswa Tank .. .. .. | (2)<br>2 | (427)<br>444 | (429)<br>446 | 446 | .. | .. | .. |
| 30 | Lower Panjhra River Works .. .. | (344)<br>355<br>(1,149)<br>*1,149 | (747)<br>760<br>(130)<br>*130 | (1,091)<br>1,115<br>(1,279)<br>*1,279 | 1,115<br>*1,279 | .. | 614 | 25·65 |
| 31 | Krishna Canal .. .. .. | (3,537)<br>4,265 | (1,041)<br>1,251 | (4,578)<br>5,516 | 4,969 | 547 | 112 | 2·45 |
| 32 | Rewari Canal .. .. .. | (87)<br>112 | (526)<br>620 | (613)<br>732 | 731 | 1 | 29 | 4·73 |
| 33 | Upper Man River Works .. .. | (21)<br>30 | (694)<br>807 | (715)<br>837 | 833 | 4 | 65 | 9 |
| 34 | Yerla River Irrigation Works .. .. | (244)<br>331 | (2,670)<br>3,144 | (2,914)<br>3,475 | 3,441 | 34 | 508 | 17 |
| 35 | Chikhli Canal .. .. .. | (137)<br>163 | (126)<br>155 | (263)<br>318 | 314 | 4 | .. | .. |
| 36 | Maini Tank .. .. .. | (15)<br>19 | (974)<br>1,002 | (989)<br>1,121 | 1,107 | 14 | .. | .. |

I-E—*contd.*

| Average discharges, cubic feet per second. | | | | Area irrigated per cubic foot per second. | | | | Base to which the duties of water are calculated. | |
|---|---|---|---|---|---|---|---|---|---|
| At Head. | | Utilized. | | Discharged at Head. | | Utilized. | | Kharif. | Rabi. |
| Kharif. | Rabi. | Kharif. | Rabi. | Kharif. | Rabi. | Kharif. | Rabi. | | |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| | | | | Acres. | Acres. | Acres. | Acres. | | |
| 65 | 120 | 65 | 120 | 52 | 25 | 52 | 25 | 15th February to 14th October. | 15th October to 14th February |
| ·68 | 2·75 | ·68 | 2·75 | 780 | 383 | 780 | 383 | Do. .. | Do. |
| .. | 3·08 | .. | 3·08 | .. | 150 | .. | 150 | Do. .. | Do. |
| .. | 15·15 | .. | 15·15 | .. | 174 | .. | 174 | Do. .. | Do. |
| 0·42 | 4·22 | 0·42 | 4·22 | 26 | 142 | 26 | 142 | Do. .. | Do. |
| 14·55 | 40·49 | 14·55 | 40·49 | 20 | 20 | 20 | 20 | Do. .. | Do. |
| 0·09 | 0·04 | 0·09 | 0·04 | 55 | 400 | 55 | 400 | Do. .. | Do. |
| 0·009 | 4·37 | 0·009 | 4·37 | 222 | 97 | 222 | 97 | Do. .. | Do. |
| 2·07 | 0·56 | 2·07 | 0·56 | 733 | 2,250 | 733 | 2,250 | Do. .. | Do. |
| 49·68 | 71·31 | 49·68 | 71·31 | 85 | 52 | 85 | 52 | Do .. | Do. |
| 1·02 | 4·61 | 1·02 | 4·61 | 86 | 117 | 86 | 117 | Do. .. | Do. |
| 0·24 | 5·08 | 0·24 | 5·08 | 96 | 140 | 96 | 140 | Do. .. | Do. |
| 2·23 | 13·44 | 2·23 | 13·44 | 129 | 210 | 129 | 210 | Do. .. | Do. |
| 0·59 | 1·13 | 0·59 | 1·13 | 249 | 210 | 249 | 210 | Do. .. | Do. |
| 0·11 | 4·55 | 0·11 | 4·55 | 164 | 219 | 164 | 219 | Do. .. | Do. |

# STATEMENT

| No. | Name of work. | Area irrigated. | | | | | Double cropped. | |
|---|---|---|---|---|---|---|---|---|
| | | Kharif. | Rabi. | Total. | Flow. | Lift. | Area irrigated. | Percentage of total area. |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | Acres. | Acres. | Acres. | Acres. | Acres. | Acres. | |
| | WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT —*concld.* | | | | | | | |
| | UNPRODUCTIVE—*contd.* | | | | | | | |
| | *Southern Circle.* | | | | | | | |
| 37 | Gokak Canal—First Section .. .. | 6,659 | 2,957 | 9,616 | 9,363 | 253 | 907 | 9·43 |
| 38 | Muchkundi Tank .. .. .. | 9 | .. | 9 | 9 | .. | .. | .. |
| 39 | Dambal Tank .. .. .. | 3<br>*144 | ..<br>.. | 3<br>*144 | 3<br>*144 | .. | .. | .. |
| 40 | Medleri Tank .. .. .. | 32 | 7 | 39 | 35 | 4 | .. | .. |
| 41 | Madag Tank .. .. .. | 251 | 139 | 390 | 390 | .. | .. | .. |
| 42 | Asundi Tank .. .. .. | 32 | ..<br>*182 | 32<br>*182 | 32<br>*182 | .. | .. | .. |
| 43 | Dharma Canal .. .. .. | 431<br>*8,648 | ..<br>.. | 431<br>*8,648 | 431<br>*8,648 | .. | .. | .. |
| | Total, Unproductive .. | 157,642<br>*9,941 | 95,678<br>*312 | 253,320<br>*10,253 | 248,974<br>*10,253 | 4,346 | 5,279 | 2·04 |
| | Grand Total, Productive and Unproductive | 159,708<br>*11,383 | 98,819<br>*740 | 258,527<br>*12,123 | 254,129<br>*12,123 | 4,398 | 5,389 | 1·99 |

*Note.*—The bold figures in brackets represent areas actually irrigated during the respective seasons and the duties have crops are irrigated. To obtain correct duties therefore these crops have to be added to the rabi areas.

(*a*) Low duties on the Nira Right Bank Canal are due to scattered nature of irrigation.

(*b*) The duties on the Pravara Canals are low due to high proportion of sugarcane and other perennial crops.

(*c*) Figures of "utilized" discharge are not available, as the quantity let into the Matoba Tank could not be acurately

(*d*) The low duties are due to high proportion of perennial irrigation.

(*e*) There is generally no supply in the Kasurdi, Shirsuphal, Matoba, Bhadalwadi, Parsul and Bhatodi Tanks in the hot and other causes. The actual number of days on which the channels were in flow has therefore been taken

(*f*) The high duties on the Bhatodi Tank are due to concentrated irrigation on small channel, and because major

(*h*) The difference between the discharge at head and utilized in respect of the Nira Left Bank Canal was due to water the Mutha Canals it was due to water having run to waste through escapes, etc.

*Area under consolidated assessment.

†47 (120 − 73 = 47) cusecs were supplied to the Khari Cut Canal through Bhujwa Channel to Bokh Reservoir.

I-E—*concld.*

| Average discharges, cubic feet per second. | | | | Area irrigated per cubic foot per second. | | | | Base to which the duties of water are calculated. | |
|---|---|---|---|---|---|---|---|---|---|
| At Head. | | Utilized. | | Discharged at Head. | | Utilized. | | | |
| Kharif. | Rabi. | Kharif. | Rabi. | Kharif. | Rabi. | Kharif. | Rabi. | Kharif. | Rabi. |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| | | | | Acres. | Acres. | Acres. | Acres. | | |
| 55·63 | 48·94 | 55·63 | 48·94 | 112·53 | 105 | 112·53 | 105 | 15th February to 14th October. | 15th October to 14th February. |
| .. | .. | .. | .. | .. | .. | .. | .. | Do. .. | Do. |
| 1·58 | 0·14 | 1·58 | 0·14 | 93·04 | .. | 93·04 | .. | 16th January to 15th October. | 16th October to 15th January. |
| 1·58 | 2·76 | 1·58 | 2·76 | 20·25 | 2·54 | 20·25 | 2·54 | Do. .. | Do. |
| 1·54 | 2·60 | 1·54 | 2·60 | 162·99 | 53·46 | 162·99 | 53·46 | Do. .. | Do. |
| 1·15 | 1·10 | 1·15 | 1·10 | 27·83 | 165·45 | 27·83 | 165·45 | Do. .. | Do. |
| 46·32 | 6·10 | 46·32 | 6·10 | 196·01 | .. | 196·01 | .. | Do. .. | Do. |
| .. | .. | .. | .. | .. | .. | .. | .. | | |
| .. | .. | .. | .. | .. | .. | .. | .. | | |

been calculated on these figures. In the rabi season in addition to pure rabi crops, perennial and eight months

measured.

weather season. Even during the monsoon and rabi seasons the channels are closed for days together due to rainfall
for purpose of calculating average discharge and duties. No discharge could be worked out on the Kasurdi Tank.

portion of irrigation is seasonal.

having been let into the Shetphal Tank and run to waste through scouring sluices. In regard to the Pravara Canals and

# STATEMENT I-F.

*Statement showing water-rates per acre in force during 1938-39 on Irrigation Works in the Province of Bombay*

| No. | Name of Work. | WATER-RATES. Irrigation in blocks. | Perennial. | Two Seasonal. | Monsoon, four months. | Rabi, four months. | Hot weather. | Miscellaneous. | Single watering. | Occupier's rate. | Owner's rate. | Water advantage. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. | | | |
| | **Works for which Capital and Revenue Accounts are kept.** | | | | | | | | | | | |
| | PRODUCTIVE. | | | | | | | | | | | |
| | *Southern Circle.* | | | | | | | | | | | |
| 1 | Gadikeri Tank* .. | .. | .. | .. | .. | .. | .. | .. | .. | | | |
| 2 | Mavinkop Tank* .. | .. | .. | .. | .. | .. | .. | .. | .. | | | |
| | *Central Circle.* | | | | | | | | | | | |
| 3 | Ekruk Tank a .. | .. | A 35<br>B 17½ | 8 | 3 | 5 | 7 | .. | 2 | *Nil.* | *Nil.* | *Nil.* |
| 4 | Shahada Channel a .. | .. | A 28<br>B 14 | 8 | 3 | 5 | 6 | .. | 2 | | | |
| | UNPRODUCTIVE. | | | | | | | | | | | |
| | *Northern Circle.* | | | | | | | | | | | |
| 5 | Hathmati Canal a[1] .. | .. | ($b^3$) | .. | D 3<br>E 1 | 3 | 6 | .. | 2 | | | |
| | Khari Cut Canal a[1] .. | .. | ($b^3$) | .. | D 7<br>E 1 | 5 | 6 | .. | 1<br>**2 | | | |
| 6 | Wangroli Tank a[2] .. | .. | ($b^3$) | 6½ | D 5<br>E 2½ | 4 | 6 | .. | 1½ | | | |
| 7 | Savli Tank a[4] .. | .. | ($b^3$) | 8 | D 5<br>E 4 | 4 | 6 | .. | 1½ | | | |
| 8 | Saiat Tank a[5] .. | .. | ($b^3$) | 6½ | D 4<br>E 2½ | 4 | 6 | .. | 1½ | | | |
| 9 | Tranza Nagrama Tanks, a[3] | .. | ($b^3$) | 6 | D 4<br>E 2 | 4 | 6 | .. | 1 | | | |
| 10 | Futelao Tank a[6] .. | .. | ($b^3$) | .. | D 4<br>E 2 | a[7] 3<br>a[8] 2 | 5 | .. | a[9] 1 | *Nil.* | *Nil.* | *Nil.* |
| | *Deccan Irrigation Circle.* | | | | | | | | | | | |
| 11 | Nira Left Bank Canal<br>Shetphal Tank (*d*) .. | §19<br>¶16 | M 45<br>C 66<br>B 22½<br>K 15 | Light 8<br>Med. 12 | Light 3<br>Med. 4½ | Light 5<br>Med. 7½ | Light 7<br>Med. 10½ | | (*e*) 2 | | | |
| 12 | Nira Right Bank Canal (*d*). | §19<br>¶16 | M 45<br>C 66<br>B 22½<br>K 15 | Light 8<br>Med. 12 | Light 3<br>Med. 4½ | Light 5<br>Med. 7½ | Light 7<br>Med. 10½ | | (*e*) 2 | | | |

## STATEMENT I-F—*contd.*

| No. | Name of Work. | Water rates. Irrigation in blocks. | Perennial. | Two Seasonal. | Monsoon, four months. | Rabi, four months. | Hot weather. | Miscellaneous. | Single watering. | Occupier's rate. | Owner's rate. | Water advantage. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. | | | |
| | **Works for which Capital and Revenue Accounts are kept—** *contd.* | | | | | | | | | | | |
| | UNPRODUCTIVE—*contd.* | | | | | | | | | | | |
| | *Deccan Irrigation Circle* —contd. | | | | | | | | | | | |
| 13 | Mutha Canals and Matoba Tank (*d*) (*c*)— | | | | | | | | | | | |
| | Sugarcane under the Mutha Canals within the Poona City and Suburban Municipal and Cantonment limits or within one mile of those limits. | .. | 50 | | | | | | | | | |
| | On all remaining land commanded by both the canals. | .. | M 45 | Light 8 Med. 12 | Light 3 Med. 4½ | Light 5 Med. 7½ | Light 7 Med. 10½ | .. | (*e*) 2 | *Nil.* | *Nil.* | *Nil.* |
| | Pan gardens .. | .. | C 66 | | | | | | | | | |
| | Perennial crops other than sugarcane and pan gardens. | .. | B 22½ | | | | | | | | | |
| | Pomegranates .. | .. | 15 | | | | | | | | | |
| | Matoba Tank .. | .. | (*f*) | | | | | | | | | |
| 14 | Kasurdi Tank (*d*) .. | .. | | | | | | | | | | |
| 15 | Shirsuphal Tank (*d*) | .. | X | 8 | 3 | 5 | 6 | .. | (*e*) 2 | *Nil.* | *Nil.* | *Nil.* |
| 16 | Bhadalvadi Tank (*d*) | .. | | | | | | | | | | |
| 17 | Godavari Right Bank Canal (*d*) | §19 | M 45 C 66 | Light 8 Med. 12 | Light 3 Med. 4½ | Light 5 Med. 7½ | Light 7 Med. 10½ | .. | (*e*) 2 | | | |
| | Godavari Left Bank Canal (*d*). | ¶16 | B 22½ K 15 | | | | | | | | | |
| 18 | Chankapur Tank— Girna Canal (*d*) .. | .. | X | 8 | 3 | 5 | 6 | .. | (*e*) 2 | | | |

# STATEMENT I-F—*contd.*

| No. | Name of Work. | Water-rates: Irrigation in blocks. | Perennial. | Two Seasonal. | Monsoon, four months. | Rabi, four months. | Hot weather. | Miscellaneous. | Single watering. | Occupier's rate. | Owner's rate. | Water advantage. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Works for which Capital and Revenue Accounts are kept—** *contd.* | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. | | | |
| | UNPRODUCTIVE—*contd.* | | | | | | | | | | | |
| | *Deccan Irrigation Circle*—concld. | | | | | | | | | | | |
| 19 | Kadwa River Works (*d*)— | | | | | | | | | | | |
| | Waghad Tank .. | .. | | | | | | | | | | |
| | Palkhed Canal .. | .. | | | | | | | | | | |
| | Ojhar-Tambat Canal. | .. | X | 8 | 3 | 5 | 6 | .. | (*e*) 2 | *Nil.* | *Nil.* | *Nil.* |
| | Wadali Canal .. | .. | | | | | | | | | | |
| 20 | Pravara Canals (*d*) .. | §19<br>¶16 | M 45<br>C 66<br>B 22½<br>K 15 | Light 8<br>Med. 12 | Light 3<br>Med. 4½ | Light 5<br>Med. 7½ | Light 7<br>Med. 10½ | .. | (*e*) 2 | | | |
| 21 | Bhatodi Tank (*d*) .. | .. | X | 8 | 3 | 5 | 6 | .. | (*e*) 2 | | | |
| | *Central Circle.* | | | | | | | | | | | |
| 22 | Parsul Tank a .. | .. | | | | | | | | | | |
| 23 | Koregaon Tank a .. | .. | | | | | | | | | | |
| 24 | Ashti Tank a .. | .. | A 28 | 8 | 3 | 5 | 6 | .. | (*e*) 2 | | | |
| 25 | Pathri Tank a .. | .. | B 14 | | | | | | | | | |
| 26 | Mhaswad Tank a .. | .. | | | | | | | | | | |
| 27 | Jamda Canals a .. | .. | | | | | | | | | | |
| 28 | Hartala Tank a .. | | | | | | | | | | | |
| 29 | Mhasva Tank a .. | .. | A 12<br>B 9 | 5 | 2 | 3 | 4 | .. | (*e*) 1 | | | |
| 30 | Lower Panjhra River Works a | .. | A 28<br>B 14 | 8 | 3 | 5 | 6 | .. | (*e*) 2 | | | |
| 31 | Krishna Canal a .. | .. | A 32<br>B 16 | 8 | 3 | 5 | 8 | .. | (*e*) 2 | | | |
| 32 | Revari Canal a .. | .. | A 28<br>B 14 | 8 | 3 | 5 | 6 | .. | (*e*) 2 | | | |
| 33 | Upper Man River Works a | .. | A 28<br>B 14 | 8 | 3 | 5 | 6 | .. | (*e*) 2 | *Nil.* | *Nil.* | *Nil.* |
| 34 | Yerla River Irrigation Works a .. | .. | A 28<br>B 14 | 8 | 3 | 5 | 6 | .. | (*e*) 2 | | | |
| 35 | Chikhli Canal a .. | .. | A 28<br>B 14 | 8 | 3 | 5 | 6 | .. | (*e*) 2 | | | |
| 36 | Maini Tank a .. | .. | A 28<br>B 14 | 8 | 3 | 5 | 6 | .. | (*e*) 2 | | | |

# STATEMENT I-F—*concld.*

| No. | Name of Work. | Water rates. Irrigation in blocks. | Water rates. Perennial. | Water rates. Two Seasonal. | Water rates. Monsoon, four months. | Water rates. Rabi, four months. | Water rates. Hot weather. | Water rates. Miscellaneous. | Single watering. | Occupier's rate. | Owner's rate. | Water advantage. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Works for which Capital and Revenue Accounts are kept—** *concld.* | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. | | | |
| | UNPRODUCTIVE—*concld.* | | | | | | | | | | | |
| | *Southern Circle.* | | | | | | | | | | | |
| 37 | Gokak Canal, 1st Section and Storage Works (*u*). | .. | ($b^1$) 27½<br>($b^2$) 20 | 8 | 3 | 5 | 15 | .. | 2 | *Nil.* | *Nil.* | *Nil.* |
| 38 | Muchkundi Tank (*s*).. | .. | 10 | 5 | 2 | 2 | 5 | .. | 1 | | | |
| 39 | Dambal Tank (*w*) .. | .. | (*x*) 14 | (*y*) 6<br>(*z*) 7½ | (*m*) 4 | (*n*) 4½ | (*l*) 7 | .. | (*j*) 1<br>(*k*) 2 | | | |
| 40 | Medleri Tank (*w*) .. | .. | (*x*) 14 | (*y*) 6<br>(*z*) 7½ | (*m*) 4 | (*n*) 4½ | (*l*) 7 | .. | (*j*) 1<br>(*k*) 2 | | | |
| 41 | Madag Tank (*w*) .. | .. | (*x*) 12 | (*y*) 6<br>(*z*) 7½ | (*m*) 4 | (*n*) 4½ | (*l*) 7 | .. | (*j*) 1<br>(*k*) 2 | | | |
| 42 | Asundi Tank (*w*) .. | .. | (*x*) 14 | (*y*) 6<br>(*z*) 7½ | (*m*) 4 | (*n*) 4½ | (*l*) 7 | .. | (*j*) 1<br>(*k*) 2 | | | |
| 43 | Dharma Canal ($a^{10}$) .. | .. | .. | .. | (*o*) 4½ | .. | .. | .. | (*k*) 1<br>(*j*) 2 | | | |

NOTE.—(1) For lift irrigation in the Deccan Irrigation Circle the orders contained in G. R., No. 4771/27, dated 23rd December 1931, are that lift from Budkis should not be allowed at all in areas under the flow command of a canal and that in other areas it may be allowed only when the supply of water for irrigation is in excess of the demand at half the flow rates for all crops other than sugarcane for which full rate should be charged.

(2) For lift irrigation half the ordinary rates are charged in other circles.

(3) Double or treble the ordinary rates are charged as penal rates for taking water without permission.

(4) Leakage or percolation rates are the same as ordinary rates.

(5) Water-rates for non-irrigational purposes are charged at the rates sanctioned by Government in each case.

(6) In the D. I. C. monsoon or two seasonal crops which take pre-seasonal waterings between the 25th April and the break of the monsoon are charged the following water rates per acre according to the date of first watering applied for and sanctioned, *vide* G. R. No. 5602/27, dated 9th December 1931 :—

| Water taken from the date | Rate for light type of crops. | Rate for medium type of crops. |
|---|---|---|
| | Rs. | Rs. |
| 25th April .. .. .. .. .. | 5 | 7½ |
| 5th May .. .. .. .. .. | 4 | 6 |
| 15th May .. .. .. .. .. | 3 | 4½ |

(7) A reserve rate of Rs. 3 per acre as a minimum rate has been sanctioned for lands let out for cultivation in the basin of Lake Beale—*vide* G. R. No. 2484, dated 12th June 1925.

(8) A flat rate of Rs. 2-8-0 per acre of culturable area has been sanctioned for the supply of water from the irrigation channel of Sangvi village near Bhatgar—*vide* G. R. No. 1849/27, dated 5th January 1932.

(9) The supply of water to the road side trees, etc., is charged as follows :—
Rs. 10 per 100 Nos. for trees, planted along field boundaries, roadsides, etc.
Re. 1 per 100 Nos. of seedlings, shrubs, etc.

(10) Long term fruit trees on the Nira Right Bank Canal are charged at half rates for the first five years from the date of their plantation, *vide* G. R. No. 2353/27, dated 13th December 1932.

(11) Short terms, cane and other perennials are charged in accordance with the scales laid down in G. R. Nos. 8670, dated 13th January 1927 and 3098/27, dated 6th November 1929 and 5602/27, dated 4th December 1935.

*Lands wholly assessed at consolidated rates.
§Block rate for blocks in 1 : 3 proportion of sugarcane.
¶Block rate for blocks in 1 : 4 proportion of sugarcane.
**For single watering for crops for which no application for irrigation throughout the season was received.

A—For sugarcane and pan gardens.

B—For perennial crops other than sugarcane.

C—For pan gardens for the whole year. If water is given for part of the year the charge will be on the basis of thrice the medium seasonal rates for the seasons concerned—*vide* G. R. No. 5602/27, dated 9th December 1931.

D—For rice.

E—For crops other than rice.

K—For pomegranates.

M—For sugarcane.

X—For sugarcane and pan gardens double the seasonal rates and for other perennial crops single seasonal rates shall be charged.

(*c*) On the Matoba tank the rates for sugarcane is the rate in force on irrigation works for short term cane.

(*d*) Rates sanctioned in G. R. No. 929/36, dated 4th January 1938 to be in force up to 14th February 1939.

(*e*) The single-watering rate applies to one pre-seasonal or post-seasonal watering to a sanctioned crop. If more than one such watering is taken, the full seasonal rate will be charged unless specifically ordered otherwise. The single watering rate is not applicable to seasonal irrigation.

(*f*) For sugarcane the short-term cane rates as per scale sanctioned in G. R. No. 8670, dated 13th January 1927 (which may be in force on major irrigation works), for pan gardens the same rate as on the Mutha Canals and for other perennials single medium seasonal rates will be charged—*vide* G. R. No. 5602/27, dated 9th December 1931.

(*j*) From 15th June to 14th October.
(*k*) From 15th October to 14th June.
(*l*) From 15th February to 14th June.
(*m*) From 15th June to 14th October or 15th July to 30th November.
(*n*) From 15th October to 14th February.
(*o*) For four months from 15th June to 15th October or 15th July to 15th November.
(*s*) In force up to 15th February 1942—*vide* G. R. No. 5459/27, dated 29th January 1936.
(*u*) In force up to 14th February 1940—*vide* G. R. No. 1604/36, dated 22nd September 1937.
(*w*) Rates sanctioned in G. R. No. 3187/27, dated 1st February 1935 to be in force up to 14th February 1940.
(*x*) For sugarcane, betel leaves, etc., for 12 months.
(*y*) For eight months from 15th June to 14th February.
(*z*) For eight months from 15th October to 14th June or 1st August to 31st March.

a Rates to be in force up to 14th February 1940—*vide* G. R. No. 929/36, dated 9th December 1938.

a[1] Rates sanctioned in G. R. No. 5956/27, dated 26th May 1936 to be in force up to 14th February 1942.

a[2] Rates sanctioned in G. Rs. Nos. 825, dated 30th August 1924 and 825, dated 1st November 1926 and continued in G. R. No. 2881/27, dated 4th July 1929, are further continued up to 14th February 1940—*vide* G. R. No. 2881/27, dated 9th July 1934.

a[3] Rates to be in force up to 31st July 1943—*vide* G. R. No. 2704/36, dated 23th November 1938.

a[4] Rates to be in force up to 15th June 1940—*vide* G. R. No. 2894/27, dated 1st June 1934.

a[5] Rates sanctioned in G. R. No. 5412, dated 15th December 1926, are to be in force up to 15th June 1940—*vide* G. R. No. 2835/27, dated 2nd July 1934.

a[6] Rates to be in force up to 14th February 1940—*vide* G. R. No. 2691/27, dated 9th July 1934.

a[7] For ordinary rabi.

a[8] For restorative crops grown after rice.

a[9] In either kharif or rabi season.

a[10] Rates sanctioned in G. R. No. 293/27 of 29th January 1936, are to be in force up to 31st March 1942.

(*b*[1]) Rate for perennial 12 months.

(*b*[2]) Rate for perennial 8 months from 15th June to 14th February.

(*b*[3]) Single seasonal rates are charged—*vide* G. R. No. 3343/27, dated 8th October 1929.

*Statement showing expenditure on establishment in the Roads and Buildings and the Irrigation Branches of the P. W. D. from the year 1921-22 to 1938-39 and the percentage on the total outlay on works and repairs during that period in both the Branches.*

*Statement showing expenditure on establishment in the Roads and Buildings and the Irrigation total outlay on works and repairs*

| Year | Expenditure on Establishment in the Roads and Buildings Branch | | | | | | |
|---|---|---|---|---|---|---|---|
| | 50—Civil Works—Provincial | 81—Civil Works | 50—Civil Works—Central | 8—Military Works | Deposit Works | Total Establishment charges | Percentage on the total outlay on works and repairs in the Roads and Building Branch |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. | |
| 1921-22 .. | 29,06,955 | .... | 1,98,683 | 45,258 | 2,84,992 | 34,35,888 | 19·26 |
| 1922-23 .. | 20,14,640 | 8,34,450 | 1,78,163 | 71,481 | 77,143 | 31,75,877 | 20·79 |
| 1923-24 .. | 15,84,488 | 8,10,645 | 67,892 | 38,560 | 6,88,354 | 31,89,939 | 19·88 |
| 1924-25 .. | 16,89,892 | 12,25,632 | 1,19,721 | 27,862 | 2,52,556 | 33,15,663 | 19·67 |
| 1925-26 .. | 18,89,417 | 12,05,078 | 1,01,876 | 69,049 | 2,58,535 | 35,23,955 | 20·66 |
| 1926-27 .. | 25,30,286 | 5,97,486 | 1,68,896 | 5,882 | 3,94,389 | 36,96,939 | 23·76 |
| 1927-28 .. | 21,99,448 | 5,59,107 | 1,49,132 | 5,042 | 2,97,270 | 32,09,999 | 24·96 |
| 1928-29 .. | 22,40,393 | 6,56,713 | 2,29,540 | 2,240 | 2,56,180 | 33,85,066 | 25·03 |
| 1929-30 .. | 22,45,450 | 7,33,867 | 1,56,773 | 3,638 | 2,34,897 | 33,74,625 | 25·26 |
| 1930-31 .. | 25,51,711 | 1,80,139 | 1,72,163 | 2,415 | 85,444 | 29,91,872 | 32·35 |
| 1931-32 .. | 25,93,104 | 2,32,929 | 1,22,799 | 3,182 | 44,132 | 29,96,146 | 38·70 |
| 1932-33 .. | 23,74,603 | 71,981 | 85,143 | 3,334 | 17,156 | 25,52,217 | 39·79 |
| 1933-34 .. | 22,73,945 | 31,807 | 71,866 | 3,810 | 30,502 | 24,11,930 | 37·97 |
| 1934-35 .. | 21,88,729 | 38,278 | 62,472 | 2,693 | 47,694 | 23,39,866 | 35·82 |
| 1935-36 .. | 20,51,807 | 808 | 89,984 | 1,539 | 54,593 | 21,98,731 | 35·75 |
| 1936-37 .. | 23,14,593 | 619 | 61,859 | 1,124 | 57,679 | 24,35,874 | 31·66 |
| 1937-38 .. | 22,61,828 | 699 | 58,352 | 998 | 47,319 | 23,47,689 | 24·46 |
| 1938-39 .. | 20,85,355 | .... | 10,113 | 769 | 65,701 | 21,61,938 | 25·28 |

*Note.*—The percentage of the establishment charges on the cost of works and repairs in the Irrigation Branch that the establishment charges in the Irrigation Branch include the cost of Special Revenue Establishment employed works and repairs, and that these charges also include cost of part of the time of Irrigation establishment spent on management" and not to execution of works and repairs. If these establishment charges debited in the accounts to on the cost of works and repairs will not be so divergent. The increase in the rate per cent. in the R. & B. in the same ratio in which expenditure on works is reduced. A mere overall percentage on expenditure on works is

The figures from the year 1921-22 to 1934-35 pertain both to the Province of Bombay and Sind.

*Branches of the P. W. D. from the year 1921-22 to 1938-39 and the percentage on the during that period in both the Branches.*

| Expenditure on Establishment in the Irrigation Branch | | | | | | | |
|---|---|---|---|---|---|---|---|
| 68—Construction of Irrigation, Navigation, Embankment and Drainage Works | XVII-Works for which capital accounts are kept | 18—Other Revenue Expenditure financed from Ordinary Revenue | Deposit Works | Total establishment charges | Percentage on the total outlay on works and repairs in the Irrigation Branch | Total Establishment charges in the Roads and Buildings and Irrigation Branches | Percentage on the total outlay of works and repairs in the Roads and Buildings and Irrigation Branches |
| 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| Rs. | Rs. | Rs. | Rs. | Rs. | | Rs. | |
| 11,53,734 | 13,85,960 | 6,68,651 | 2,770 | 32,11,115 | 33·59 | 66,47,003 | 24·26 |
| 14,20,751 | 13,44,901 | 5,34,327 | 1,993 | 33,01,972 | 32·22 | 64,77,849 | 25·38 |
| 21,87,793 | 14,43,222 | 4,32,013 | 2,056 | 40,65,084 | 33·89 | 72,55,023 | 25·87 |
| 29,10,785 | 17,37,724 | 5,26,361 | 492 | 51,75,362 | 28·73 | 84,91,025 | 24·35 |
| 32,21,647 | 17,99,343 | 5,19,228 | 2,681 | 55,42,899 | 21·62 | 90,66,854 | 21·23 |
| 35,56,959 | 18,08,385 | 5,94,989 | 3,207 | 59,63,540 | 30·56 | 96,60,479 | 27·54 |
| 36,98,956 | 19,20,773 | 7,80,312 | 3,847 | 64,03,888 | 26·00 | 96,13,887 | 25·64 |
| 39,04,670 | 21,35,939 | 6,16,601 | 2,750 | 66,59,960 | 25·51 | 1,00,45,026 | 25·35 |
| 42,26,873 | 21,08,302 | 6,18,312 | 1,012 | 69,54,499 | 23·26 | 1,03,29,124 | 23·88 |
| 42,88,966 | 18,31,149 | 5,99,621 | 1,734 | 67,21,470 | 21·60 | 97,13,342 | 24·06 |
| 40,37,972 | 16,34,011 | 5,18,627 | 86 | 61,90,696 | 22·40 | 91,86,842 | 25·97 |
| 28,70,427 | 23,53,971 | 4,01,329 | 680 | 56,26,407 | 28·54 | 81,78,624 | 31·30 |
| 17,60,090 | 29,83,531 | 5,14,407 | 48,960 | 53,06,988 | 40·41 | 77,18,918 | 39·61 |
| 15,36,830 | 30,98,255 | 4,55,037 | 441 | 50,90,563 | 42·89 | 74,30,429 | 40·38 |
| 1,37,301 | 8,66,476 | 1,73,501 | 61 | 11,77,339 | 89·46 | 33,76,070 | 45·21 |
| 74,021 | 8,24,868 | 1,63,507 | 620 | 10,63,016 | 83·73 | 34,98,890 | 39·04 |
| 68,679 | 7,70,784 | 1,27,039 | 73 | 9,66,575 | 82·27 | 33,14,264 | 30·77 |
| 53,922 | 8,22,086 | 1,39,881 | .... | 10,15,881 | 92·85 | 31,77,827 | 32·95 |

(column 14) is generally higher than that in the Roads and Buildings Branch (column 8). The reason is largely entirely on "revenue management" work on certain canal systems which has no connection with the execution of revenue management including the *control and distribution of water*, which is debited in the accounts to "revenue "revenue management" are deducted from the total cost of establishment in the Irrigation Branch the percentage Branch is mainly due to decrease in outlay on "works" and "repairs". Establishment charges cannot be reduced inaccurate.

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